2017 ANNUAL REPORT

Groundwater Monitoring and Whole-House Filter Program for Moses Lake Wellfield Superfund Site (Former Larson Air Force Base)

Moses Lake, Washington

CERCLIS Site No. WAD988466355

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EXECUTIVE SUMMARY

The purpose of this Annual Report is to summarize findings from the 2017 Moses Lake Wellfield Superfund Site (Site) sampling program. The U.S. Army Corps of Engineers (USACE) conducted this sampling program on behalf of the U.S. Environmental Protection Agency (EPA), Region 10. The objectives of this sampling program are 1) to ensure protection of human health by sampling groundwater and comparing contaminant concentrations to the federal drinking water maximum contaminant level (MCL) for Site contaminants such as trichloroethene (TCE), and 2) to gather baseline data prior to the implementation of groundwater pump and treat systems. As part of the sampling program, USACE also installs and maintains whole-house filter (WHF) treatment systems at ten private properties to prevent human exposure to TCE and related contaminants of concern (COCs) at levels that exceed the MCLs.

The 2017 sampling program consisted of three sampling events that occurred in January, May, and August. During the 2017 sampling program, the TCE MCL (5.0 micrograms per liter [µg/L]) was exceeded in approximately 30% of the monitoring wells. The TCE MCL was exceeded in a private well with a WHF and at WP-04, the well that services Granite Construction for industrial purposes.

USACE sampled approximately 78 private wells and 79 monitoring and extraction wells over the course of the year, and also replaced granular activated carbon (GAC) annually for the private wells with WHFs. There was one detection of TCE and cis-DCE below the MCL in the mid sample at WP-14; however, the effluent (water going into home) sample had no detections, which confirmed that the WHFs are protecting human health. An action threshold of 2 µg/L TCE has been used to place private wells on quarterly sampling (as opposed to annual sampling), and an action threshold of 3.5 µg/L TCE has been used to determine which private wells receive a WHF. In 2017, no private wells exceeded the TCE action threshold of 3.5 µg/L; thus, no WHFs were installed.

Recommendations from the 2017 sampling program and the status as of the end of 2017 are provided in Section 6.

Contents

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ACRONYMS

1,1-DCE	1,1-dichloroethene
ARI	Analytical Resouce, Inc.
ADR	Automated data review
AFB	Air Force Base
BTEX	Benzene, toluene, ethylbenzene, xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cis-DCE	cis-1,2-dichloroethene
CSM	Conceptual site model
COC	Contaminant of concern
1,2-DCA	1,2-dichloroethane
1,1-DCA	1,1-dichloroethane
DERP-FUDS	Defense Environmental Restoration Program - Formerly Used Defense Sites
DQIs	Data Quality Indicators
DQOs	Data Quality Objectives
DRO	Diesel range organics
DoD QSM	Department of Defense Quality Systems Manual for Environmental Laboratories
DSHS	(Washington) Department of Social and Health Services
DVR	Data Validation Report
EPA	United States Environmental Protection Agency
GAC	Granular activated carbon
GRO	Gasoline range organics
IA	Interagency Agreement
IC	Institutional Control
IROD	Interim Record of Decision
LAFB	Larson Air Force Base
LDC	Laboratory Data Consultants
MCL	Maximum contaminant level
MWH	Montgomery Watson Harza
NC	Not calculated
MS	Matrix spike
MSD	Matrix spike duplicate
µg/L	Micrograms per liter
PDB	Passive diffusion bag
PE	Performance evaluation
PFBS	Perfluorobutanesulfonic acid
PFAA	Perfluorinated alkyl acids
PFHpA	Perfluoroheptanoic acid
PFHxS	Perfluorohexanesulfonic acid
PFNA	Perfluorononanoic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
QC	Quality Control
QAPP	Quality Assurance Project Plan

QCSR	Quality Control Summary Report
RI	Remedial Investigation
RL	Reporting limit
ROE	Right-of-entry
SEDD	Staged electronic data deliverable
SOW	Scope of work
TCE	Trichloroethene
trans-DCE	trans-1,2-dichloroethene
1,1,1-TCA	1,1,1-trichloroethane
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
VC	Vinyl chloride
VOC	Volatile organic compounds
WDOE	Washington State Department of Ecology
WDOH	Washington State Department of Health
WP-QAPP	Work Plan-Quality Assurance Project Plan
WHF	Whole-house filter

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1. INTRODUCTION

The purpose of this Annual Report is to summarize findings from the 2017 Moses Lake Wellfield Superfund Site (Site) groundwater sampling program. The U.S. Army Corps of Engineers (USACE) conducted this sampling program on behalf of the U.S. Environmental Protection Agency (EPA), Region 10, pursuant to the 2008 Interim Record of Decision (IROD) for the Site (EPA 2008) and the 2017 USACE Work Plan-Quality Assurance Project Plan (WP-QAPP; USACE 2017). USACE provides ongoing technical assistance focused on groundwater sampling and whole-house filter (WHF) maintenance as required to protect human health. This report is organized as follows:

- Section 1: Introduction
- Section 2: Sampling and Field Activities for 2017
- Section 3: Analysis, Data Validation, and Results
- Section 4: State Well Inventory Database Search
- Section 5: Summary and Discussion
- Section 6: Recommendations

1.1. 2017 Sampling Program Scope of Work

The scope of work for the USACE 2017 sampling program consisted of the following activities:

- Notifying residents of 2016 annual sampling results in early 2017;
- Obtaining and updating rights-of-entry (ROEs) for site access;
- Awarding a new WHF base contract for WHF maintenance;
- Maintaining and servicing the WHF treatment systems;
- Collecting, analyzing, and evaluating contaminant of concern (COC) data and groundwater elevation data in groundwater monitoring wells;
- Collecting, analyzing, and evaluating COC data in unfiltered private wells and private wells with WHF systems
- Coordinating and contracting with laboratories and subcontractors for data analysis and data validation;
- Updating the project database (EQuIS™) with sampling results and updating an Excel spreadsheet with sampling results;
- Updating the online mapping system with TCE results;
- Reviewing the Washington State Department of Ecology (WDOE) well inventory database for newly constructed private wells that may be at risk for COCs; and
- Preparing a WP-QAPP for the 2018 work; and preparing an Annual Report summarizing 2017 activities (this document).

1.2. Site Background

The Site is located within and beyond the northwestern region of the City of Moses Lake, Washington. See Figure 1 for the Site's location and Figure 2 for the institutional control (IC) boundaries and plumes. The Site encompasses approximately 15 square miles and includes the Grant County International Airport and surrounding area (formerly the Larson Air Force Base [LAFB]), commercial facilities, and residences.

Previous environmental investigations conducted at the Site identified contamination of soil and groundwater resulting from historic operation of the former LAFB and industrial activities associated with the aircraft industry. Potential source areas are scattered throughout the Site, and approximately 1000 acres of groundwater have been identified as contaminated to date.

Previous investigations focused primarily on the former LAFB. The former LAFB occupied approximately 9607 acres and was active from 1942 until 1966. In 1988, three municipal wells operated by the City of Moses Lake were found to be contaminated with trichloroethene (TCE). Additionally, TCE was historically detected in two domestic wells operated by the Skyline Water System, Inc., a private water provider located in unincorporated Grant County south of the former LAFB property. Domestic (residential) and commercial (light or heavy industrial) private well locations outside the former base have also had detections of TCE. TCE concentrations associated with the Site have been found to exceed EPA's National Primary Drinking Water Standards (the maximum contaminant level [MCL]) under the Federal Safe Drinking Water Act. The MCL represents the maximum level (i.e., concentration) of the contaminant allowed in drinking water, and is set at 5 micrograms per liter (µg/L) for TCE.

Based on the TCE detections described above, between 1989 and 1993 the city chose to fix the three contaminated city water-supply wells south of the airport by extending the casings down to the lower basalt aquifers. In addition, the Skyline community, which was dependent on the Skyline water system, received an alternative water source (bottled water) between 1997 and 2003. In 2003, USACE completed construction of a replacement water-supply well, which draws water from a deeper, uncontaminated groundwater aquifer and currently provides drinking water to the Skyline community.

Following findings of contaminated domestic (private) wells and upon request from Region 10 EPA, USACE began a private well groundwater sampling program in 2001. The groundwater sampling program has been used to ensure that humans are not exposed to contaminant concentrations above the MCL, and to monitor TCE plume migration. Under this program, drinking water from private wells[1] and small drinking water systems (Group A and B systems)[2] were sampled (with some gaps between sampling events) for TCE-related compounds. Recently, USACE has also been sampling monitoring wells at least annually, and those data are presented with the results from private wells and small drinking water systems in an annual report (this document). City of Moses Lake wells are routinely sampled for volatile organic compounds (VOCs)

1 Private wells consist of wells used for drinking and other domestic uses, and industrial process wells.
2 A "Group A" public water system is defined in RCW 70.119A.020 as a public water system with at least 15 service connections regardless of the number of people; or a system serving an average of 25 or more people per day for at least 60 days per year, regardless of number of service connections; or a system serving 1,000 or more people on two or more consecutive days. A "Group B" public water system is any public water system that does not meet the definition of a Group A system. For ease of reporting, small drinking water systems are reported as part of private wells.

per Washington State Department of Health (WDOH) requirements, and the results are posted on WDOH's website. However, since the wells that WDOH samples are all screened below the contaminated aquifers, those data are not included in this report.

For ease of reporting, small drinking water systems are reported as part of private wells. The majority of private wells sampled are located in the Cascade Valley area immediately downgradient of the main (north) and south plumes (see Figure 4 and Figure 5). In 2002, following two private well monitoring events, a WHF treatment system was designed and installed at five residential sites where it was determined that TCE contamination could potentially exceed the drinking water standard for TCE (5 µg/L).

Groundwater monitoring wells have been installed over the last 22 years in order to monitor contamination at the Site. Groundwater elevation data are collected where available to evaluate groundwater flow direction and are also used to evaluate plume migration at groundwater monitoring wells.

An IROD was signed in September 2008 (EPA 2008) for cleanup actions in areas with soil and groundwater contamination that exceed risk-based concentrations. The IROD required groundwater pump and treat systems to be installed for two of the five identified TCE plumes. The IROD further specified that cleanup levels will be attained throughout all the plumes, but active remediation may be discontinued if it can be demonstrated that natural attenuation (through dilution) can remediate the remnant plumes in a reasonable timeframe (within an estimated 30 years for cleanup).

The IROD specifies that information gathered during groundwater monitoring, as well as design and operation of the selected groundwater pump and treat system, be used to determine the need for refinement of the selected groundwater remedy to meet groundwater restoration goals. Currently, EPA is designing a pump and treat system for the south plume that is anticipated to be operational in 2019 (see Figure 2). Information from operation of the south plume pump and treat system will be used to make decisions on a second pump and treat system that is planned to be installed for the main plume.

The COCs monitored in the groundwater sampling program are as follows:

- trichloroethene (TCE)
- cis-1,2-dichloroethene (cis-DCE)
- trans-1,2-dichloroethene (trans-DCE)
- vinyl chloride (VC)
- 1,1-dichloroethene (1,1-DCE)
- 1,2-dichloroethane (DCA)
- 1,1,1-trichloroethane (TCA)
- 1,1-dichloroethane (1,1-DCA)

Only TCE, however, has a cleanup level established in the IROD, and the other VOCs have either never been detected or have been detected only at levels significantly below any established MCL or risk-based cleanup level.

1.3. Geologic Setting

The Site occupies a nearly flat fluvial terrace bounded to the east by Crab Creek and to the south and west by Moses Lake. The geologic units affected by contamination include, with increasing depth and from youngest to oldest, the following: sand and coarse gravel deposited by huge glacial floods (Hanford formation), silt and sand deposited in lakes and rivers (Ringold Formation, locally eroded away to the north and east), and several extensive basalt flows of the Wanapum Basalt Formation. The Wanapum Basalt at the Site is divided into three members as follows, from geologically youngest to oldest: the Priest Rapids Member, the Roza Member, and the Frenchman Springs Member. At the Site, the Roza Member consists of three basalt flows, of which Roza 1 is the youngest and always the first encountered. The Priest Rapids Member overlies the Roza Member in the central portions of the Site, but is mostly highly weathered and has been eroded away entirely along the east and west margins. The basalt flows typically have a vesiculated, fractured, and sometimes brecciated flowtop overlying a dense flow interior characterized by vertical cooling fractures. The deeper and less weathered the basalt flows are, the more likely these fractures are to be completely filled by secondary minerals (EPA 2008).

Figure 3 illustrates the hydrogeologic conceptual model, which shows the geological members as defined in the IROD. The hydrostratigraphic units relevant to the Site are as follows (EPA 2008):

- Hanford Formation (**aquifer** in areas, but unsaturated beneath a substantial portion of the Site)
- Ringold Formation (semi-permeable aquitard , absent in areas)
- Priest Rapids and flow-top of Roza 1 (**aquifer**)
- Dense flow interior of Roza 1 (water-confining unit)
- Roza 2 flow top (**aquifer**)
- Dense flow interior of Roza 2 (water-confining unit)

TCE has been detected in all three aquifers described above, indicating that there is some connectivity between the units and the aquifers. For example, the highest concentrations of TCE are found in the Priest Rapids and flow-top of Roza 1 aquifer, which indicates that water is able to move through the Ringold Formation. The TCE occurrence and migration pathways are also illustrated on Figure 3, showing the complexity of contaminant flow through the fractured basalts.

Monitoring well nomenclature is based on the hydrogeologic conceptual model. The Hanford Formation aquifer is generally associated with the "AW" series of monitoring wells; the Priest Rapids and Roza 1 aquifer is associated with "BW" series of monitoring wells; and the Roza 2 basalt flow is associated with the "CW" series of monitoring wells. An example of monitoring well nomenclature is 12BW05, which represents a well drilled in 2012 (12), screened within the Priest Rapids and Roza 1 aquifer (BW), and fifth in the BW monitoring well installation series (05) for that year.

TCE contamination is found primarily in the upper basalt aquifers (Priest Rapids and Roza 1, and Roza 2). Some of the private wells may be drawing water from the overlying alluvium, but driller logs suggest that the majority of the private wells are open only in basalt. Some draw from several basalt flows, but rarely from below Roza 2.

1.4. Previous Investigations

Please see prior Annual Reports for a summary of previous investigations.

1.5. USACE Investigation Strategy

The USACE investigation strategy, with input from EPA, includes sampling groundwater monitoring wells and private wells to ensure protection of human health by comparing the results to the federal drinking water MCL for Site contaminants such as TCE that resulted from historic Site activities. The investigation strategy for monitoring wells and private wells was provided in the WP-QAPP for 2017 and is adjusted each year for the sampling program.

1.5.1. Groundwater Monitoring Wells and Extraction Wells

Groundwater monitoring well sampling has been focused on identifying TCE concentrations, tracking plume extent and migration, and collecting groundwater elevation data to evaluate groundwater flow direction. Samples have been collected using dedicated bladder pumps or passive diffusion bags (PDBs). The majority of the monitoring wells are located east and northeast of the Cascade Valley area (see Figure 4).

Groundwater analytical data will be used to assess plume migration before and after the groundwater pump and treat system is operational, and will support groundwater contour modeling. Monitoring data will be used to assess the effectiveness of the future south plume groundwater pump and treat system in restoring groundwater to federal drinking water standards and state cleanup levels.

1.5.2. Private Wells

The Moses Lake IROD requires preventing human exposure to COC concentrations in groundwater that are above their MCLs. TCE is the focus for interim groundwater monitoring activities, since it is the only COC that historically has exceeded its MCL (5 µg/L) and is the only groundwater COC listed in the IROD. The investigation strategy for the private well sampling program historically began with a list of existing private wells within the 5 µg/L TCE plume boundary or near the leading edge of the plume boundary. The majority of private wells sampled are located in Cascade Valley immediately downgradient of the main and south plumes (see Figure 5**Error! Reference source not found.**). Some well owners were recruited for the private groundwater sampling program in the 1990s and early 2000s. Other residents have asked to be included in the sampling program over the years. USACE successfully recruited many additional home owners in 2012/2013, and the private well network was also optimized in 2013 to remove a number of non-detect wells that were outside of the plume area. As more information has become available that helps identify private wells that may be affected by TCE contamination, well owners have been and will continue to be recruited for evaluation.

The 2017 sampling strategy for private wells was to sample annually the entire suite of wells. The Seasonal Trend Analysis completed in 2016 (USACE 2016) determined if wells were sampled in January or August. Groundwater elevation data are not obtained from the private wells due to the potential for entangling the water level indicator cable with pump plumbing and/or cables present in the private wells.

2. SAMPLING AND FIELD ACTIVITIES FOR 2017

The 2017 sampling program consisted of three events January, June, and August, as described below. A detailed report for each sampling event can be found in Appendix A (Field Sampling Reports). Table 1 lists the wells that were sampled for each event, and Appendix B includes comprehensive analytical results for all 2017 events.

A summary of each sampling event is provided below for groundwater monitoring wells and private wells. USACE only sampled properties where the well is located and for which we had ROEs. No sampling was conducted at homes that are supplied by neighboring wells; however, in many cases ROEs have been obtained to facilitate sending sampling results.

Private wells with WHFs (see Table 2) were sampled at the influent port (upstream of the filtration system), at the mid port (between the lead and lag filter units), and at the lag port (downstream of the lag filter unit and prior to water entering the residence) after granular activated carbon (GAC) replacement. WHFs were inspected every six months to ensure all parts were working properly and to replace the fines filters; both GAC vessels of each system were replaced annually. Private wells without WHFs were sampled from a water tap as close to the well head as possible.

2.1. Event 1 (January 2017)

2.1.1. Groundwater Monitoring Wells

During Event 1, 67 groundwater monitoring wells consisting of 33 bladder pump wells and 34 PDB wells were sampled for VOCs in accordance with the WP-QAPP. Groundwater elevation data were collected from all sampled monitoring wells.

Thirteen wells that were planned to be sampled in January 2017 were not able to be sampled for the following reasons:

- 00BW04 and 91BW02 could not be sampled because no PDB was installed.
- 00BW14 was frozen and could not be sampled.
- 91AW14, 91AW17 and 91BW04 did not have sufficient water elevation for the bladder pump to operate.
- 04CW08 could not be accessed because the property was sold and fenced.
- 12CW03 had a torn PDB.
- 16BW01, 16BW02, 16CW01, 16CW02, and 16CW03 were not installed.

2.1.2. Private Wells

During Event 1, 15 private wells, four with WHFs, were sampled for VOCs. WP-86, WP-124, WP-125 and WP-129 were sampled at the influent, mid and effluent ports. Before sample collection, totalizer flow meter readings were recorded.

Eleven private wells without WHFs (WP-03, WP-04, WP-116, WP-136, WP-137, WP-169, WP-176, WP-28, WP-66, WP-69 and WP-74) were also sampled for VOCs because the Seasonal Trend Analysis indicated that January would result in the highest TCE concentrations for these wells.

2.2. Event 2 (June 2017)

2.2.1. Groundwater Monitoring Wells

During Event 2, 12 groundwater monitoring wells consisting of 5 bladder pump wells and 7 PDB wells were sampled for VOCs in accordance with the WP-QAPP. These wells were planned for Event 1, but were not sampled for reasons mentioned in Section 2.1.1. All wells but 04CW08 were successfully sampled during Event 2. Groundwater elevation data were collected from all sampled monitoring wells. The new monitoring wells were sampled at varying depths along the screened interval to determine which depth would have the maximum TCE.

2.2.2. Private Wells

No private wells were sampled during Event 2.

2.3. Event 3 (August 2017)

2.3.1. Groundwater Monitoring Wells

No monitoring wells were sampled during the August 2017 sampling event.

2.3.2. Private Wells

During Event 3, six private wells with WHFs were sampled for VOCs. WP-14, WP-70, WP-83, WP-121, and WP-123 were sampled at all three sampling ports to determine influent TCE concentrations and if there was breakthrough of TCE in the mid or lag filters. Before sample collection, totalizer flow meter readings were recorded.

Sixty-seven private wells without WHFs were also sampled for VOCs in August 2017.

2.4. Right-of-Entry Acquisition

Right-of-entry (ROE) forms are used to obtain permission to enter onto property to conduct water sampling. In general, USACE only obtained ROEs from property owners (and tenants, if applicable) where a well is located. During 2017 sampling year, USACE acquired new ROEs at WP-31, WP-72, WP-125, WP-140, WP-141, WP-181, WP-182, and WP-183. Renewed ROEs were obtained at WP-03, WP-04, WP-09, WP-45, WP-50, WP-52, WP-54, WP-57, WP-65, WP-66, WP-68, WP-69, WP-71A, WP-71B, WP-74, WP-150, WP-175, and WP-176. During 2017 sampling year, USACE was unable to acquire ROEs for the following wells:

- WP-11: The owner was not available during the August sampling event. We do not have any contact information for this owner. The owner has refused sampling in the past. He is on well water.

- WP-33: New homeowners at WP-33 refused to have their water sampled on 8/21/17.
- WP-116: USACE mailed an ROE and attempted to visit homeowner in August 2017 to obtain new ROE. Home owner has "No Trespassing" signs.
- WP-137: The owner was amenable to having his water sampled but did not want to sign an ROE. Veronica Henzi, USACE PM, spoke with owner on 8/9/17 to confirm sampling.

USACE will continue to make an attempt at least annually to acquire an ROE.

3. ANALYSIS, DATA VALIDATION, AND RESULTS

The sections below discuss analytical and data validation procedures; groundwater elevations and analytical results for monitoring/extraction wells; and analytical results for private wells. A comprehensive table of all analytical results is provided in Appendix B.

3.1. Analytical and Data Validation Procedures

All sampling and analytical activities were executed in compliance with project data quality objectives, and the results are considered acceptable for use.

The analytical laboratory used for this project was Analytical Resources, Inc. (ARI) of Tukwila, WA. Samples were analyzed by EPA Method 524.3 for VOCs. This method produces data with the analytical sensitivity required to evaluate whether drinking water meets the federal MCLs for applicable analytes. A Quality Control Summary Report (QCSR) summarizing analytical performance expressed in terms of data quality indicators (DQIs) can be found in Appendix F.

Laboratory Data Consultants, Inc. (LDC) of Carlsbad, CA, performed the data validation task. The Data Validation Report (DVR; Appendix G [cd only]) presents Stage 2a and Stage 4 data validation results for samples collected. Data validation was performed in accordance with the requirements outlined in LDC's scope of work (SOW) for services; the USACE WP-QAPP; the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.0 (DOD 2013); and EPA's National Functional Guidelines for Superfund Organic Methods Data Review (EPA 2016). Based on the data quality assessment presented in the QCSR and the DVR, the overall quality of data is known and acceptable for the intended use.

Water samples and associated quality control (QC) samples were collected from groundwater monitoring wells and private wells in accordance with the WP-QAPP. Field QC samples included field duplicates, field blanks, trip blanks, matrix spikes (MSs), and matrix spike duplicates (MSDs). A performance evaluation (PE) sample, provided by Environmental Resource Associates of Arvada, CO, was submitted for VOC analysis during the November 2017 sampling event.

3.2. Monitoring Wells - Results

3.2.1. Groundwater Elevations

Groundwater elevations recorded during sampling are presented in Table 3. The data from January 2017 was used to create groundwater contour plots for the Priest Rapids/Roza 1 (Figure 7) and Roza 2 (Figure 8) aquifers. The data were interpolated using the Kriging method and created using the computer program Surfer Version 13 from Golden Software. A hydrogeologist reviewed the contours created from the Kriging method and modified the contours to more realistically represent groundwater flow.

The general flow direction in the Priest Rapids-Roza 1 aquifer in the northern portion of the Site is to the southwest (see Figure 7), which is consistent with previous groundwater elevation data. The groundwater flow direction within the south plume is southerly, which is consistent with previous groundwater elevation data.

The flow direction in the Roza 2 aquifer radiates to the northwest and south from well 12CW03; well 12CW03 is located in the northern portion of the south plume (see Figure 8). The contours were blanked between 12CW04 and the other Roza 2 monitoring wells to the north due to lack of data. The exact location of the peak elevation of the groundwater in the Roza 2 aquifer is not known due to this lack of data.

Groundwater elevation data were not collected from private wells due to the risk of entangling the water level indicator cord with private well pumps. In addition, unless the residents' and neighbors' use of water could be controlled, the elevations collected would not be indicative of natural contours.

3.2.2. Analytical Results

Analytical results for TCE in the groundwater monitoring and extraction wells are provided in Table 4 and shown in Figure 9 (Priest Rapids-Roza 1) and Figure 10 (Roza 2). The highest TCE result from any of the events was used to generate the figures. Of the 79 monitoring and extraction wells sampled in 2017, 30 wells had no detections above the reporting limits for VOCs, 49 wells had TCE detections above 0.2 µg /L, and a subset (eight) also had cis-DCE detections. Twenty-one of those 49 wells exceeded the MCL (5.0 µg /L) for TCE. The maximum TCE detection in the Priest Rapids-Roza 1 aquifer was 85.4 µg /L in well 12BW05 in January 2017, which was slightly less than the maximum TCE concentration (92.2 µg /L) in November 2016. The maximum cis-DCE detection in the Priest Rapids-Roza 1 aquifer was 2.25 µg /L at well 04BW06 in January 2017. The maximum TCE detection in the Roza 2 aquifer was 5.89 µg/L at well 04CW07 in January 2017. Well 04CW07 is the only Roza 2 monitoring well that exceeded the TCE MCL (5.0 µg /L); it is located below the southern portion of the south plume. Cis-DCE was detected in newly installed Roza 2 aquifer monitoring well 16CW02 at 0.95 µg /L.

3.3. Private Wells without WHFs– Results

This section summarizes the results for private wells without WHFs.

Analytical results for the private wells without WHFs are provided in Table 5. TCE and cis-DCE were the only analytes detected out of the eight VOC analytes evaluated in 2017. Of the 60 private non-WHF well locations sampled, TCE results can be summarized as follows: 21 had no detections (i.e., results were < 0.2

µg/L), and 39 had TCE detections at or above 0.2 µg/L. WP-04 exceeded the TCE MCL (5.0 µg/L); however, this well is not used for drinking water. Five private wells had cis-DCE detections.

The maximum TCE concentration was 5.65 µg/L at WP-04 in January 2017. The maximum cis-DCE concentration was also at WP-04 in January 2017; the cis-DCE concentration was 1.98 µg/L, though this value is considerably lower than the cis-DCE MCL (70 µg/L). Well WP-04 is used for industrial process water and has had TCE concentrations consistently above the MCL since February 2016. No WHF is needed at this location because the water is not being consumed. The business associated with WP-04 has been previously informed of the elevated risk associated with TCE. EPA provided signage for the business to place on the well house and at other locations where workers could come in contact with contaminated water.

No private wells without WHF (except for WP-04 as discussed above) exceeded the TCE action level of 3.5 µg/L that triggers installation of a WHF; thus, no WHFs were installed during the 2017 sampling program.

3.4. Private Wells with WHFs – Results

The analytical results and the efficiency of the WHFs are discussed below.

Table 6 provides the TCE and cis-DCE analytical results for the private wells with WHFs. Table 7 summarizes purge volumes and totalizer readings collected prior to sampling at WHF wells. For the 2017 sampling year, the WHFs were successful in reducing TCE and cis-DCE to undetected concentrations in the effluent ports, which lead into the homes, indicating that the WHFs are working effectively.

One private well with a WHF (WP-14) had a breakthrough of TCE and cis-1,2-DCE at the mid filter at concentrations of 0.39 µg/L and 1.02 µg/L, respectively. This is likely due to the high water usage at this home (approximately 1900 gallons per day). Water used for irrigating at this home is connected to the WHF system.

One private well with WHF (WP-124) exceeded the MCL (5 µg/L); however, the mid and effluent ports were non-detect for TCE, indicating the residence are not being exposed to concentrations above the MCL. Contractor-analyzed spent GAC did not exceed any Toxicity Characteristic Leaching Procedure (TCLP) thresholds in 2017.

3.5. Customer Notification of 2016 Results

The results from the 2017 sampling program (the content of this 2017 Annual Report) are expected to be mailed in February 2018.

4. STATE WELL INVENTORY DATABASE SEARCH

To determine whether additional private wells were installed within or near the VOC plume (within the IC boundary), information from the WDOE Well Logs database[3] was queried. The well logs for those wells in

[3] https://fortress.wa.gov/ecy/waterresources/map/WCLSWebMap/textsearch.aspx

or near the IC boundary are provided in Appendix H. The locations of those wells, plus additional wells outside of the IC boundary, are shown on Figure 11.

The database was searched for wells constructed or well logs received between January 1, 2017 and December 31, 2017 and screened or open to the upper basalt flows in Priest Rapids-Roza 1 and Roza 2 geologic members (see Figure 3). Following the Groundwater Institutional Control Boundary (see Figure 2), all or portions of the following Township, Range, and Sections were queried: T19N, R28E, Sections 4, 5, 6, 7, 8, 9, 16, 17, 18 and T20N, R28E, Sections 16, 17, 19, 20, 21, 22, 27, 28, 29, 30, 31, 32, 33, 34.

Four wells were identified in the query and one of those wells is located near other wells that have had detections of TCE. BIW971 is located east of the South Plume near WP-28. WP-28 has had detections of TCE in the past. USACE recommends that this well be sampled annually. This well appears to be drawing groundwater from the Roza 1 aquifer.

5. SUMMARY AND DISCUSSION

Summary and discussion of the TCE plume and WHF work for 2017 is provided below.

5.1. Site TCE Plume Discussion

During the 2017 sampling program, the TCE MCL of 5.0 µg/L was exceeded in approximately 30% of the monitoring wells, primarily in the Priest Rapids/Roza 1 monitoring wells. Regarding the private wells, approximately 56 of the 78 private wells (including WHFs) located in the Cascade Valley had detections of TCE (> 0.20 µg/L) during the 2017 sampling program. WP-04 (Granite Construction) and WP-124 exceeded the TCE MCL of 5.0 µg/L. WP-04 is used for industrial purposed and WP-124 has a WHF that is successfully reducing TCE to below the MCL.

TCE concentrations for each well are summarized in Figure 6, Figure 9, and Figure 10. The contours were initially generated using the Kriging gridding method in Golden Software's Surfer® program Version 13, which numerically estimates plume boundaries based on input data. The Surfer® Kriging method used a log-transformed distribution. Where deemed appropriate, the computer-generated contours were adjusted based on professional judgment (e.g. open-ended contours used where there are data gaps). The Priest Rapids/Roza 1 main plume is open-ended to the southwest due to lack of monitoring well data in the downgradient direction. The Priest Rapids/Roza 1 northeast plume is only defined by one monitoring well (99BW15) and two private wells (WP-14 and WP-83). The northeast plume contours are open to the northeast due to lack of data in the upgradient direction. The Priest Rapids/Roza 1 South Plume is open-ended to the southwest due to lack of monitoring wells and uncertainty of where private wells are screened.

It is anticipated that private wells, including those in the Cascade Valley, draw water from the upper basalt aquifers (Priest Rapids-Roza 1 and Roza 2) and potentially the overlying alluvium. However, limited private well construction information makes it difficult to correlate individual private wells with a specific aquifer. In addition, there are only two groundwater monitoring wells located within the Cascade Valley, and they are too distant from the other clusters of monitoring wells to help delineate the origin of groundwater contamination occurring in the Cascade Valley. The majority of private wells in Cascade Valley are downgradient from or near the leading edge of the contaminant plume. Several of the wells

sampled in the Cascade Valley area are immediately downgradient of the main (north) and/or south plumes. Monitoring wells upgradient of Cascade Valley had some detections that indicate the Main Plume is connected to contamination in Cascade Valley.

TCE results from WP-04 exceeded the TCE MCL of 5 µg/L during every sampling event in January 2017. There are multiple homes with WHF systems clustered near WP-04; however, it is unclear if these homes are drawing water from the same plumes. WP-124, a home located near WP-04, exceeded the TCE MCL of 5 µg/L during the January 2017 sampling event. WP-124 has a WHF system installed and the mid and effluent ports indicate that TCE is being reduced to below the detection level of 0.20 µg/L. Current data suggest that the private wells downgradient of WP-04 (generally southwest, see Figure 5) without WHF systems are the most at risk of exceeding the TCE MCL. Based on the groundwater elevation contours for Priest Rapids/Roza 1 monitoring wells (Figure 7) and the 2017 TCE contours (Figure 9), the source of TCE contamination in the northern Cascade Valley is likely from the Main Plume.

Due to the presence of multiple contaminant plumes and uncertainty of private well construction, private wells within the Moses Lake area with any historic COC detections are recommended for continued annual sampling until a better understanding of plume migration has been documented. Additional houses may be added based on their proximity to wells with elevated concentrations.

5.2. Suggested Improvements to Sampling Program

To help with understanding the plumes, USACE recommends installing pressure transducers and data loggers (both referred to as transducers) to monitor groundwater levels at the Site. Groundwater elevation data at the site are currently collected during groundwater sampling events, which have occurred one to four times per year. The current groundwater elevation monitoring frequency is adequate when there are no changes to the groundwater flow regime. However, the groundwater flow regime at Moses Lake will be affected if the Bureau of Reclamation increases flows in Crab Creek. Transducers allow for several groundwater level measurements per day to be collected, which can be used to observe fluctuations in groundwater elevations that periodic groundwater level monitoring would not record. Several changes in short-term groundwater elevations that could be important to document include the following:

- **Changes in flow direction and gradient**. Changes in the flow direction and gradient can affect the movement of contaminants at the site
- **Hydraulic connection between different aquifers.** Recharge from Crab Creek will likely impact the Hanford Formation and Priest Rapids/Roza 1 aquifers. Groundwater elevation data may show the rate of recharge in each aquifer and the location where the largest increase will occur.
- **Rate of recharge across the site.** The timing and magnitude of groundwater elevation increases caused by recharge from Crab Creek can be used to refine estimate of groundwater flow velocity across the site.
- **Identify the optimal time to collect groundwater samples.** The highest TCE concentrations have been measured during the highest groundwater elevations.

The transducers would be placed primarily in wells screened in the Hanford and Priest Rapids/Roza 1 formations near Crab Creek and within the Priest Rapid/Roza 1 wells near the pump and treat system. Transducers would also be installed in a couple of wells spaced across the site for which historical groundwater data show the greatest fluctuations.

5.3. Whole-House Filters

The WHFs are working as intended and reducing cis-DCE and TCE concentrations in effluent samples (i.e., in the water that is supplied to the homes) below both the MCLs and the detection limits for each. The WHF GAC vessels were exchanged annually; the fines filters were replaced approximately every six months, and the WHF systems were also inspected for general functionality at that time. No new WHFs were installed in 2017. Based on discussion with EPA in August 2016, WHF were sampled annually prior to the GAC filter change out.

In February 2017, WP-86, WP-124, WP-125, and WP-129 had GAC vessels exchanged. Influent, mid and effluent ports were sampled in January 2017. There were no detections of TCE in the mid and effluent ports, indicating the GAC filters are working efficiently.

In September 2017, WP-14, WP-70, WP-83, WP-119, WP-121, and WP-123 had GAC vessels exchanged. Influent, mid and effluent ports were sampled in January 2017. There was one detection of TCE and cis-1,2-DCE at WP-14 in the mid port and no detections of TCE in the effluent ports, indicating the GAC filters are working efficiently.

6. RECOMMENDATIONS

Section 6.1 includes recommendations from the 2016 Annual Report and status of their implementation as of December 31, 2017. Section 6.2 includes recommendations for 2018 and beyond based on 2017 activities.

6.1. Status of 2016 Annual Report Recommendations for 2017

General. USACE recommends that EPA continue to coordinate with Bureau of Reclamation (Bureau) and share information with USACE to understand the impacts of the Bureau's water management activities, since the activities may significantly affect the groundwater elevations and TCE concentrations in Moses Lake and all USACE actions taken to date (trend analysis, sampling frequency, understanding of plumes, etc).

- Status: The Bureau of Reclamation did not release any water to Crab Creek during 2017. USACE recommends EPA continue to coordinate with Bureau regarding any future plans.

6.1.1. Groundwater Monitoring Wells

- Install pressure transducers and data loggers in monitoring wells to monitor changes to groundwater elevations; changes could affect sampling timing and contaminant migration.
  - Status: Since no water is currently planned to be released through Crab Creek this recommendation is no longer applicable; however, if in the future the Bureau resumes operations than this recommendation should be considered.

6.1.2. Private Wells

- Since 2017 will consist only of yearly sampling (except for 9 wells, which will be sampled twice), USACE recommends discussing with EPA what course of action should be taken if a private well exceeds 2.0 µg/L or 3.5 µg/L only once.
  - Status: No wells that previously were below 2.0 µg/L or 3.5 µg/L exceeded these concentrations during 2017.
- USACE recommends adding two private wells to the sampling regime: BHW096, which is located southwest of WP-18N and WP-18S, and BIU598, which is located in Cascade Valley near WP-111. Both wells appear to be drawing groundwater from the Roza 1 aquifer. Groundwater from these formations has historically had TCE contamination in some areas.
  - Status: EPA approved annual sampling of BHW096 (WP-183) and BIU598 (WP-182). The results are documented in this report.

6.1.3. Whole-House Filter Systems

- Continue servicing GAC vessels annually and fines filters approximately every six months, after sampling has occurred.
  - Status: Maintenance occurred; no new WHFs were installed.

6.2. 2017 Annual Report Recommendations for 2018 and beyond

General. USACE recommends that EPA continue to coordinate with Bureau of Reclamation (Bureau) and share information with USACE to understand the impacts of the Bureau's water management activities, since the activities may significantly affect the groundwater elevations and TCE concentrations in Moses Lake and all USACE actions taken to date (trend analysis, sampling frequency, understanding of plumes, etc).

6.2.1. Groundwater Monitoring Wells

- If the Bureau continues to discharge to Crab Creek, consider installation of pressure transducers and data loggers in monitoring wells to monitor changes to groundwater elevations; changes could affect sampling timing and contaminant migration

6.2.2. Monitoring Well Clogging Evaluation

- Several of the groundwater monitoring wells have been pumping dry during low flow sampling which may indicate the wells are clogged. A video survey and drawdown and recovery test on six representative monitoring wells would provide evidence on whether monitoring wells at the site need to be redeveloped. If the wells show fouling or evidence that water is not flowing into the wells at an adequate rate for sampling then re-development of the monitoring wells that are regularly sampled would be recommended.

6.2.3. Private Wells

- Since 2018 will consist only of yearly sampling, USACE recommends discussing with EPA what course of action should be taken if a private well exceeds 2.0 µg/L or 3.5 µg/L only once.
- USACE recommends adding one private wells to the sampling regime: BIW971, located east of the South Plume near WP-28 (see Figure 11). This well appears to be drawing groundwater from the Roza 1 aquifer. Groundwater from this formation has historically had TCE contamination in some areas.

6.2.4. Whole-House Filter Systems

- Continue servicing GAC vessels annually and fines filters approximately every six months, after sampling has occurred.

References

DoD. 2013. DoD/DOE Quality Systems Manual (QSM) for Environmental Laboratories. Version 5.0. July 13, 2013.

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Montgomery Watson (MWH). 1999. Management Plan Volume II - Part 1, Field Sampling Plan Remedial Investigation/Feasibility Study Moses Lake Wellfield Superfund Site – FINAL. September 1999.

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USACE. 2016. Final 2016 Work Plan with Quality Assurance Project Plan. Groundwater Monitoring and Whole-House Filter Program for Moses Lake Wellfield Superfund Site. Former Larson AFB. Moses Lake, Washington. Original December 3, 2015. Final update March 25, 2016.

Figures

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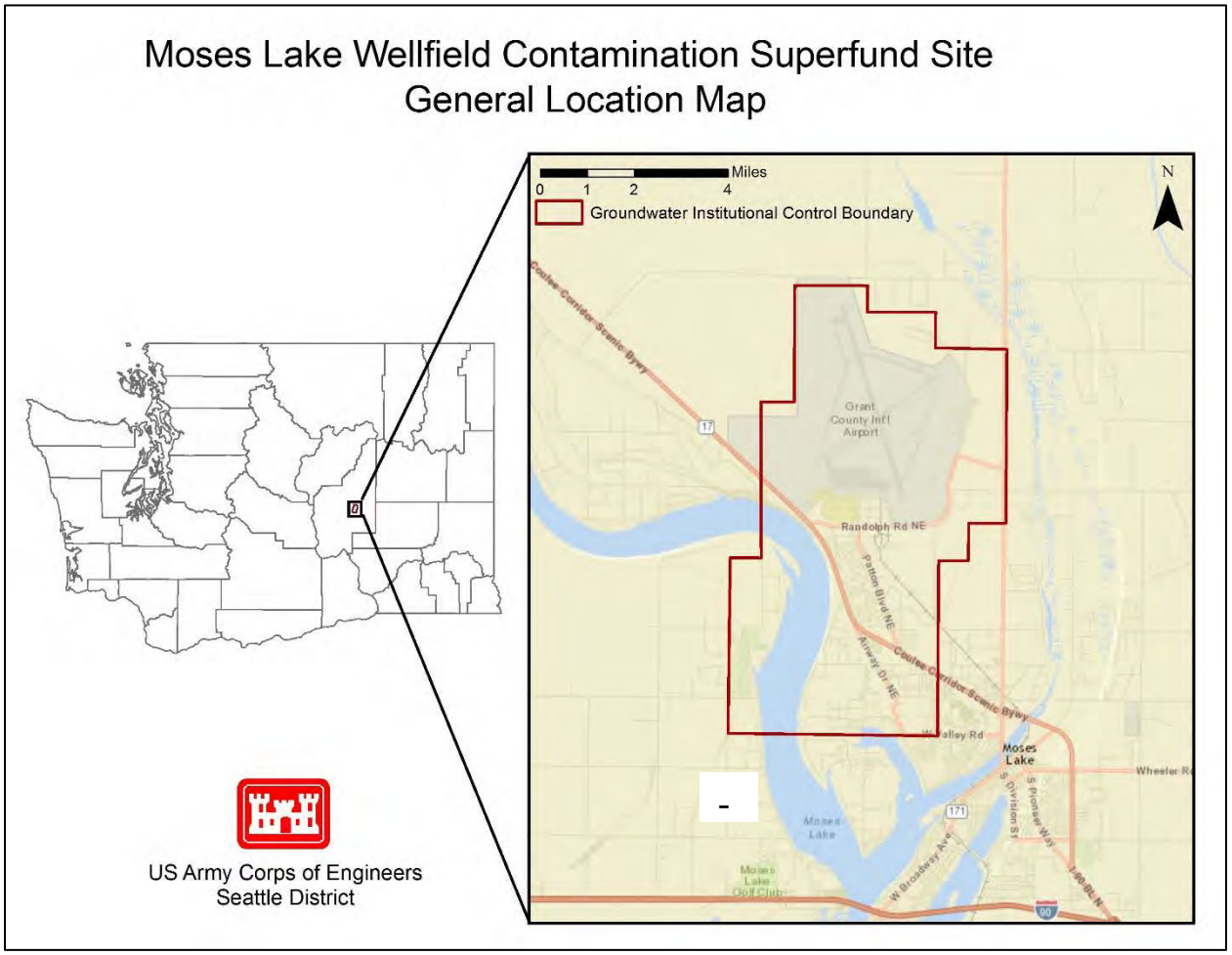

Figure 1. General Location Map for Moses Lake Wellfield Superfund Site (EPA 2008).

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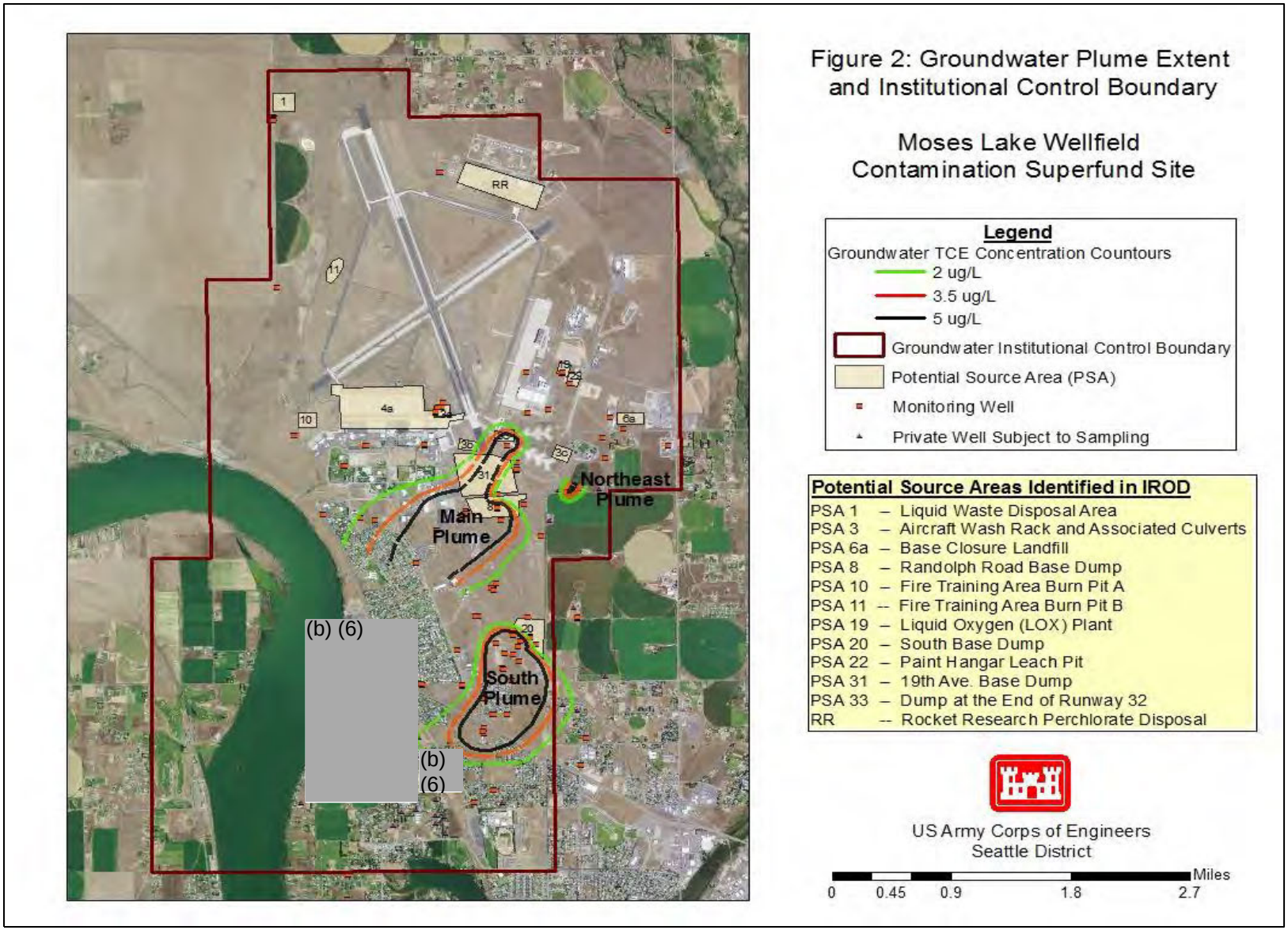

Figure 2. Groundwater plume extent as of May 2016 and institutional control boundary

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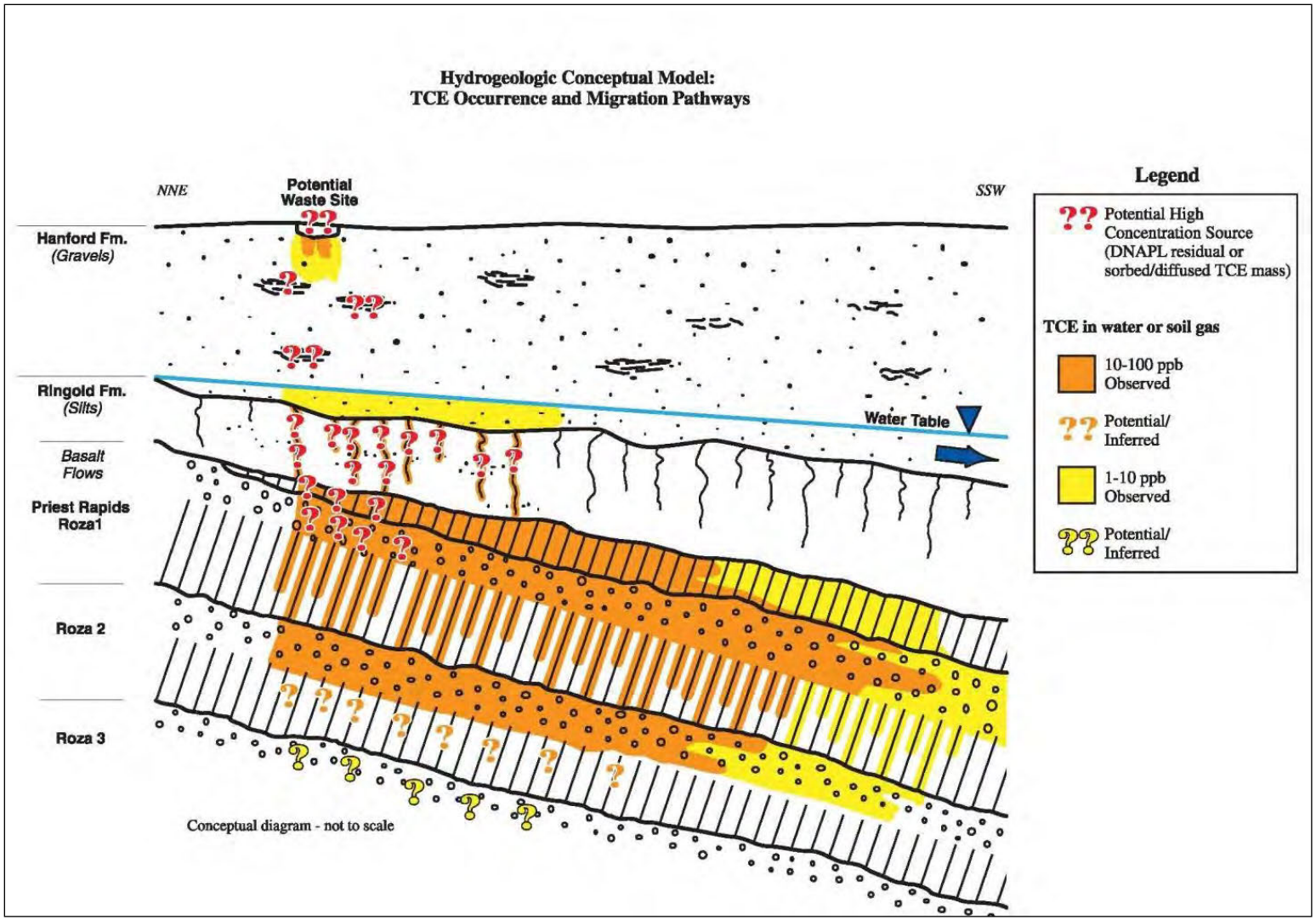

Figure 3. Hydrogeologic Conceptual Model (EPA 2008)

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Figure 4. Map of Wells and Sampling Status for 2017

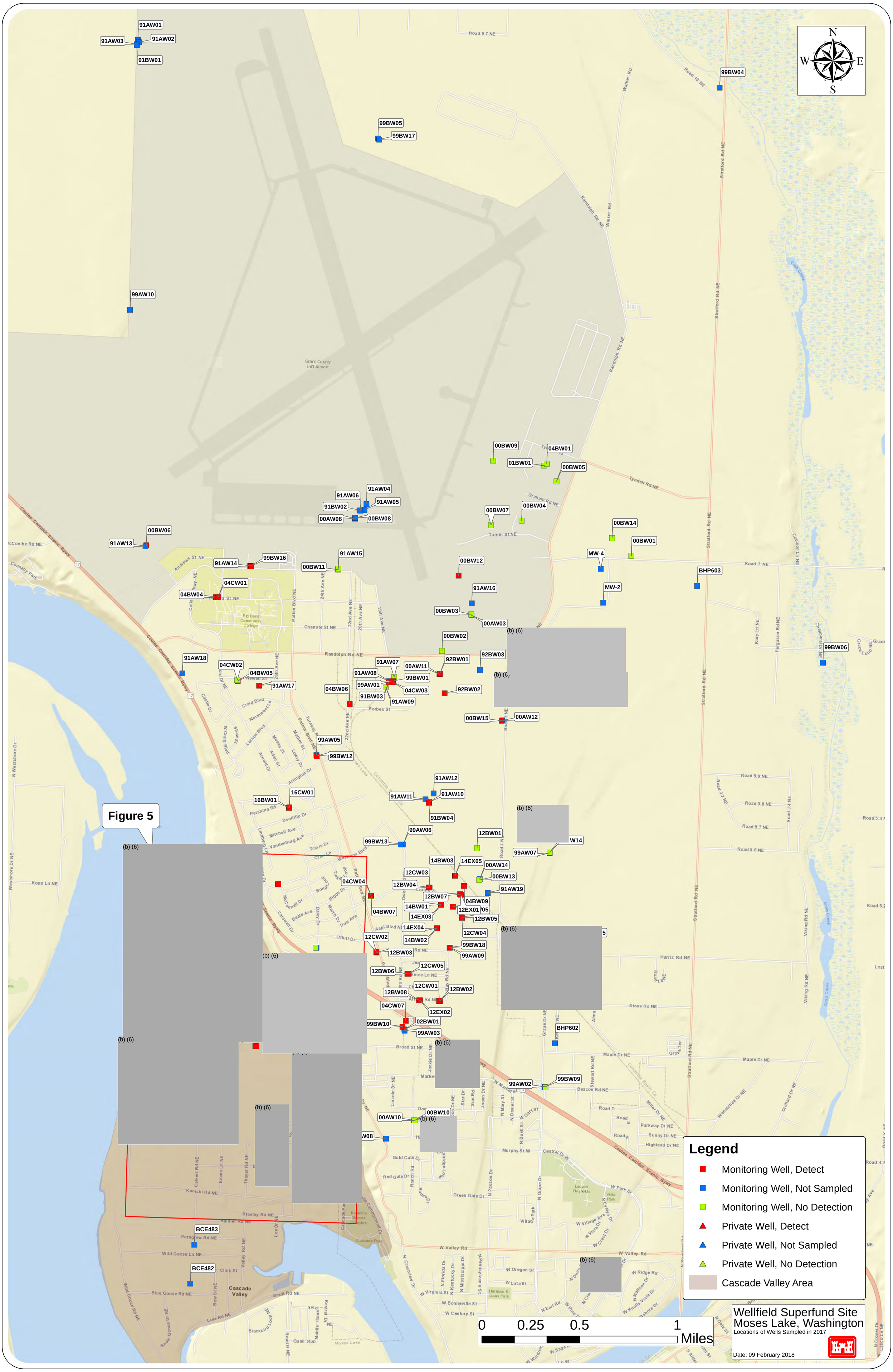

Figure 4. Map of Wells and Sampling Status for 2017

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Figure 5. Map of Wells - Cascade Valley Inset

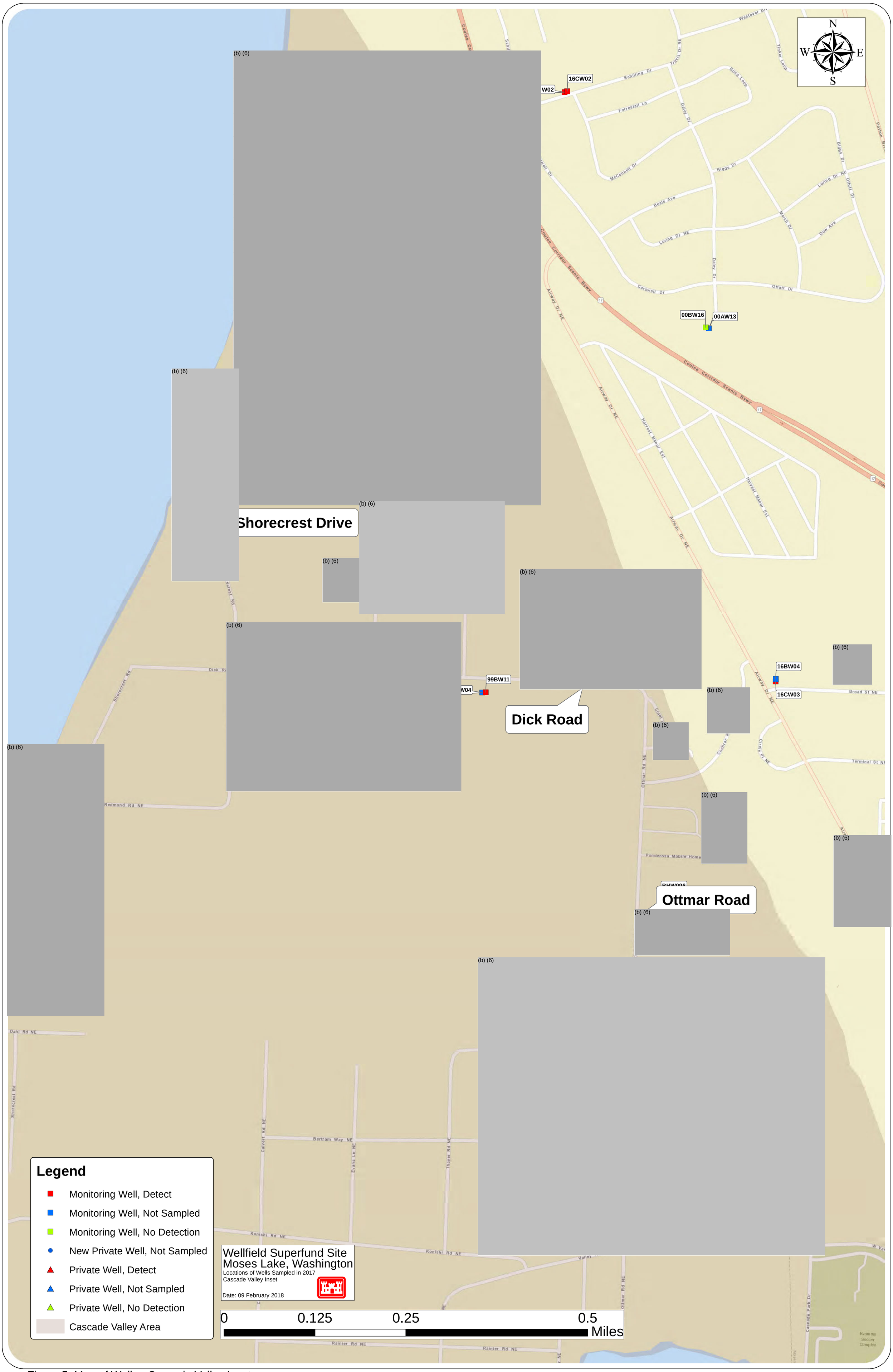

Figure 5. Map of Wells - Cascade Valley Inset

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Figure 6. Cascade Valley Inset with TCE Contours and Results (Highest Value Shown)

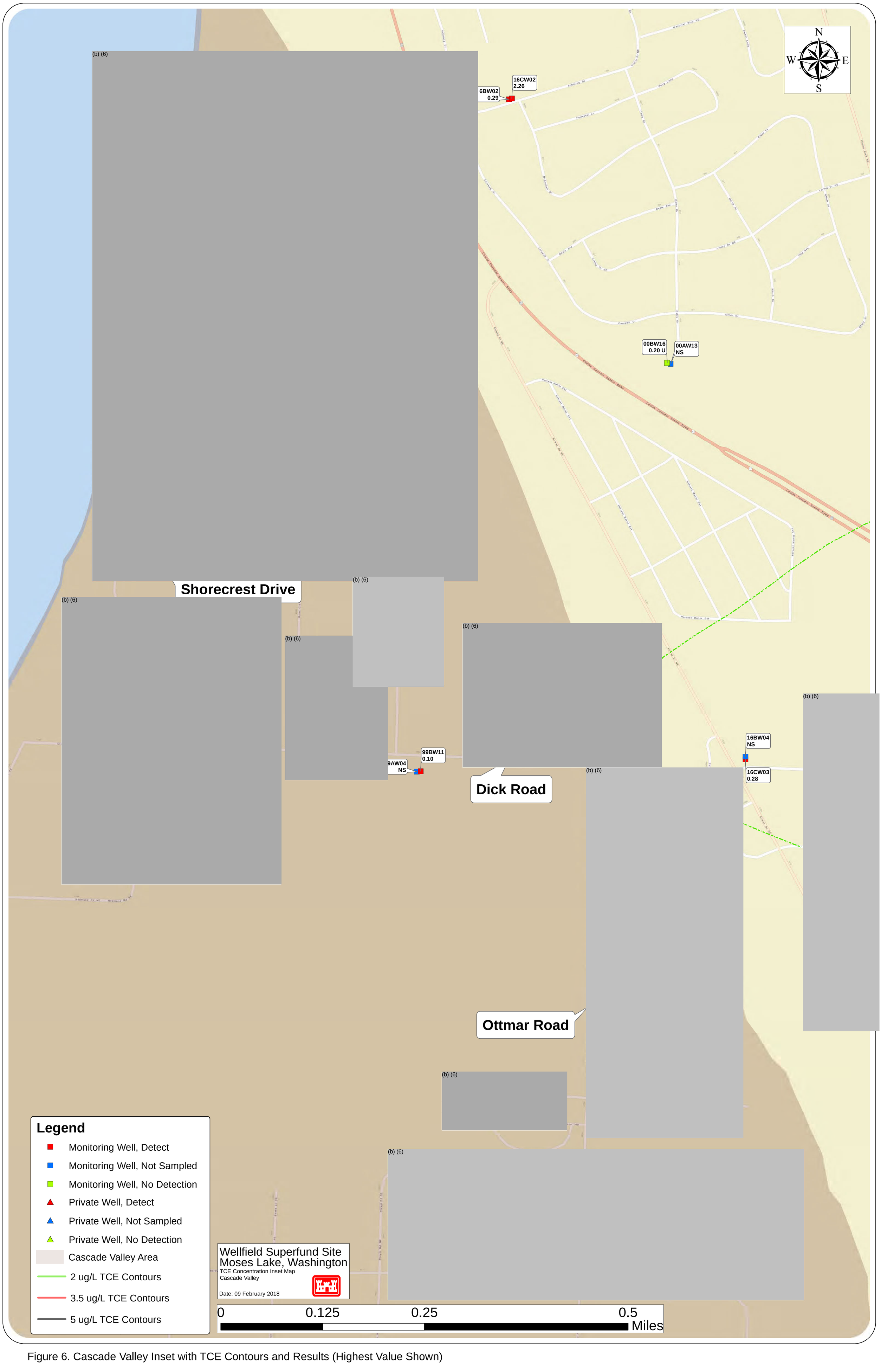

Figure 6. Cascade Valley Inset with TCE Contours and Results (Highest Value Shown)

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Figure 7. Priest Rapids-Roza 1 Monitoring Wells (BW series) with Groundwater Elevations (January 2017 Results)

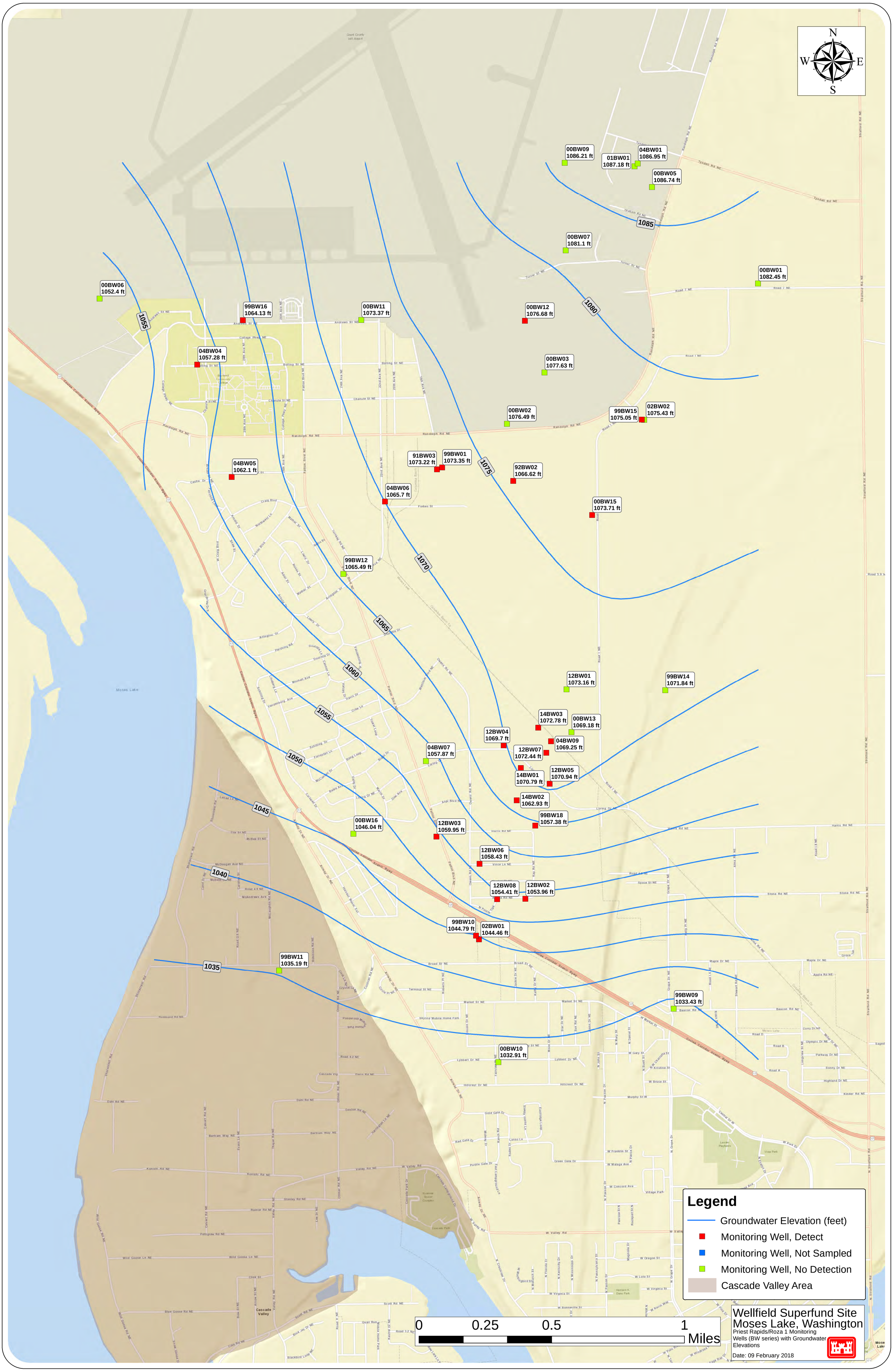

Figure 7. Priest Rapids-Roza 1 Monitoring Wells (BW series) with Groundwater Elevations

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Figure 8. Roza 2 Monitoring Wells (CW series) with Groundwater Elevations (January 2017 Results)

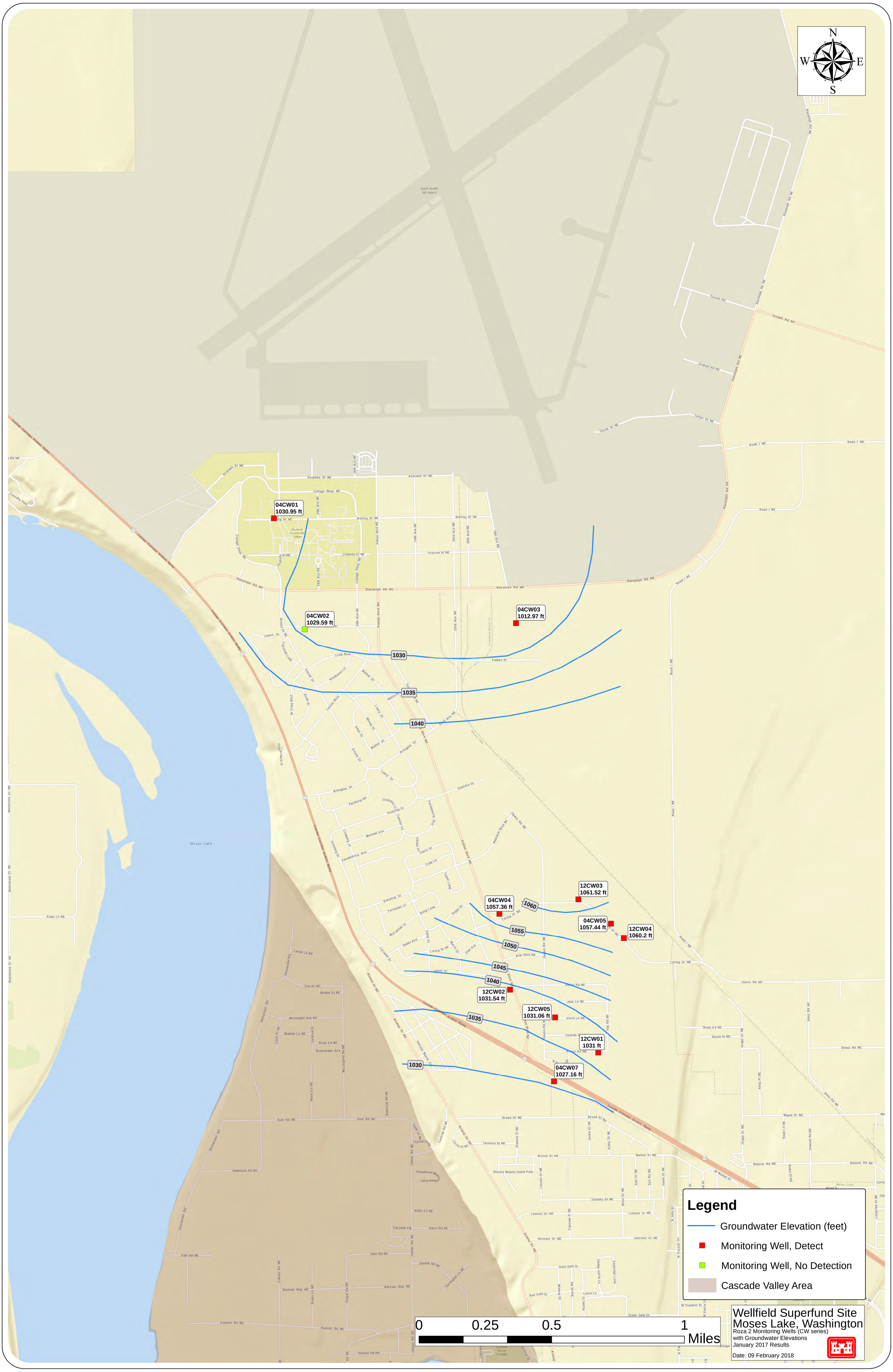

Figure 8. Roza 2 Monitoring Wells (CW series) with Groundwater Elevations

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Figure 9. Priest Rapids-Roza 1 Monitoring Wells (BW series) with TCE Contours & Results (Highest Value Shown)

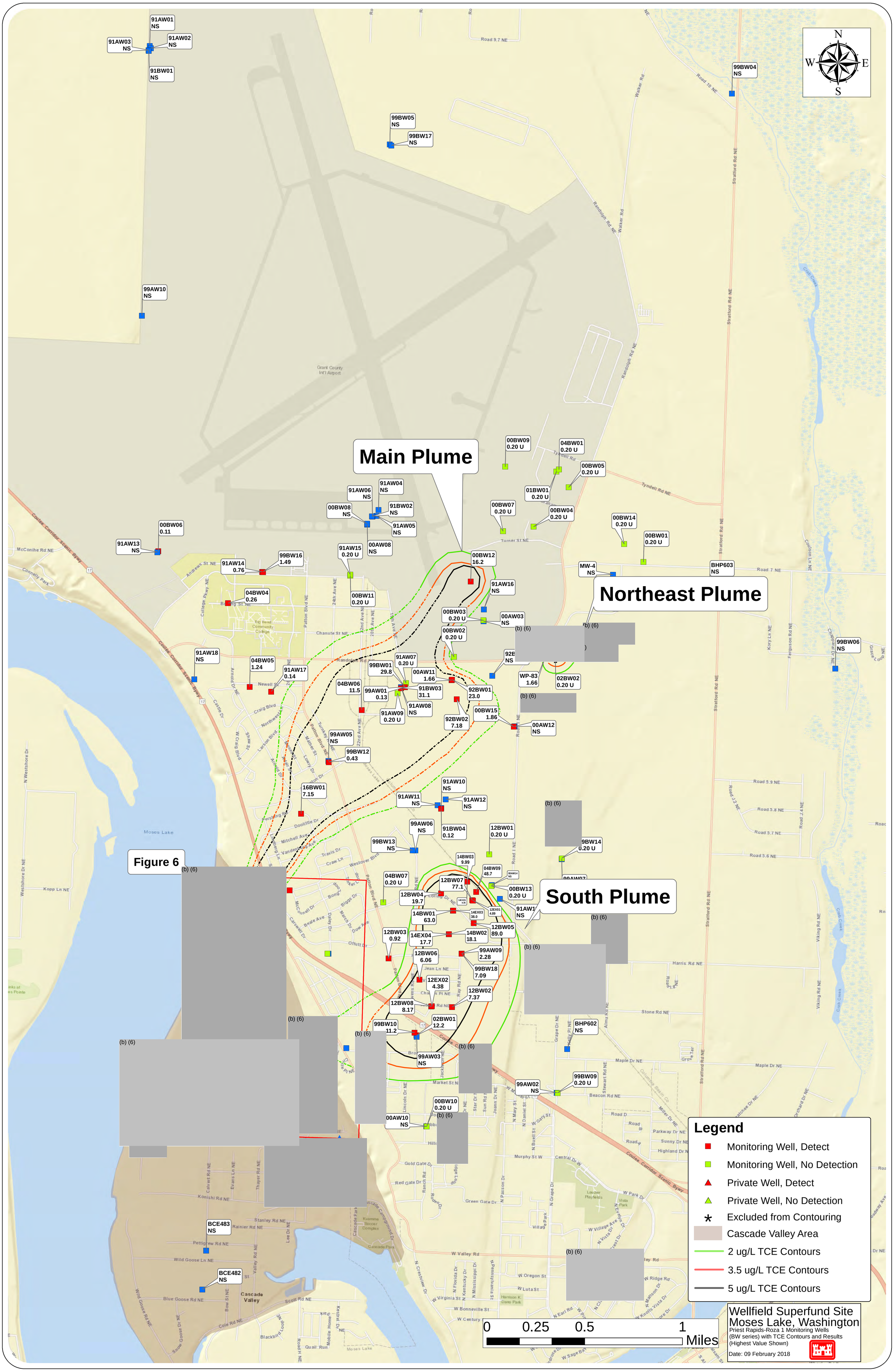

Figure 9. Priest Rapids-Roza 1 Monitoring Wells (BW series) with TCE Contours & Results (Highest Value Shown)

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Figure 10. Roza 2 Monitoring Wells (CW series) with TCE Contours & Results (Highest Value Shown)

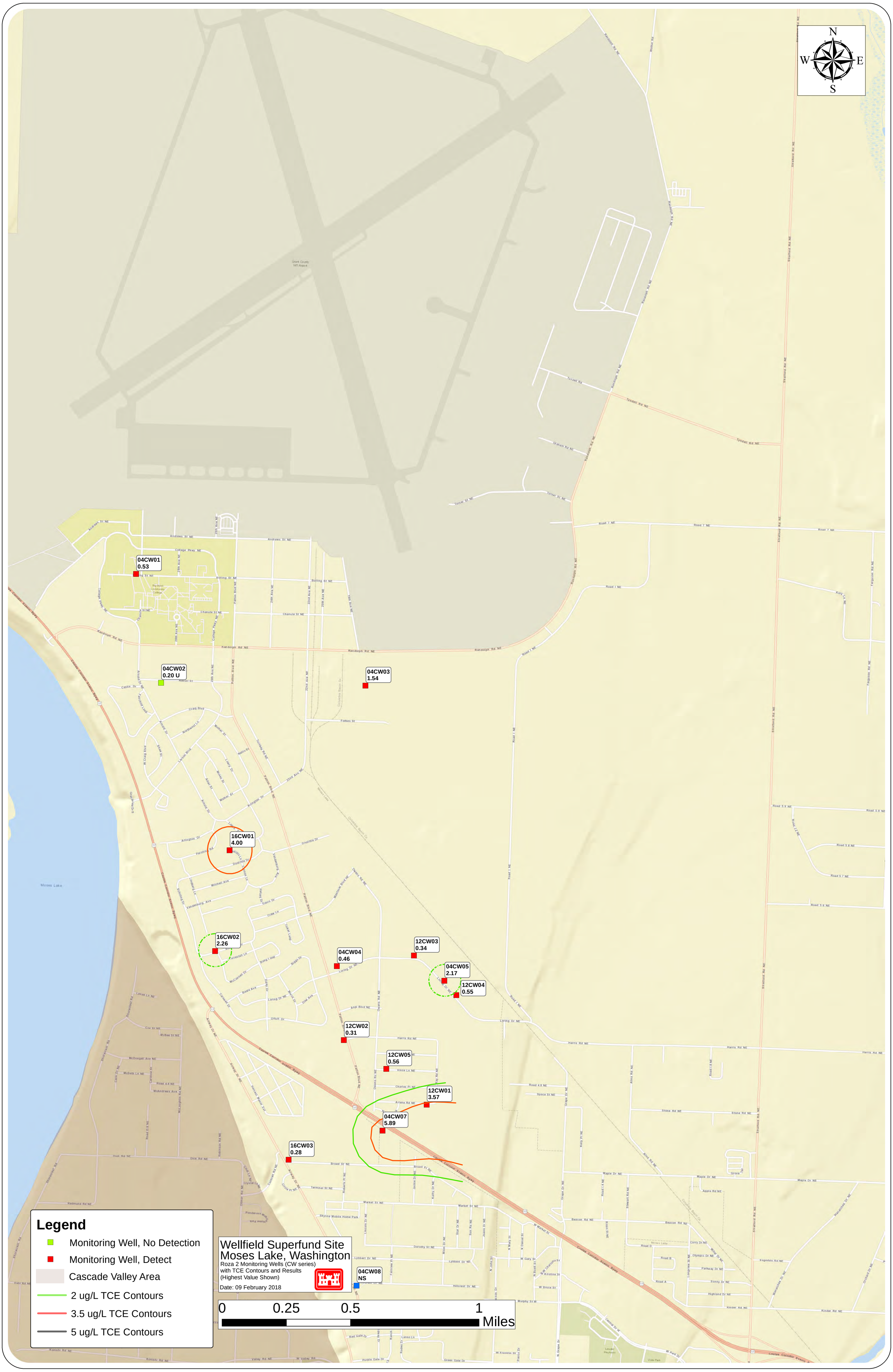

Figure 10. Roza 2 Monitoring Wells (CW series) with TCE Contours & Results (Highest Value Shown)

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Figure 11. Map of Private Wells (Ecology's Database) Associated with Appendix H

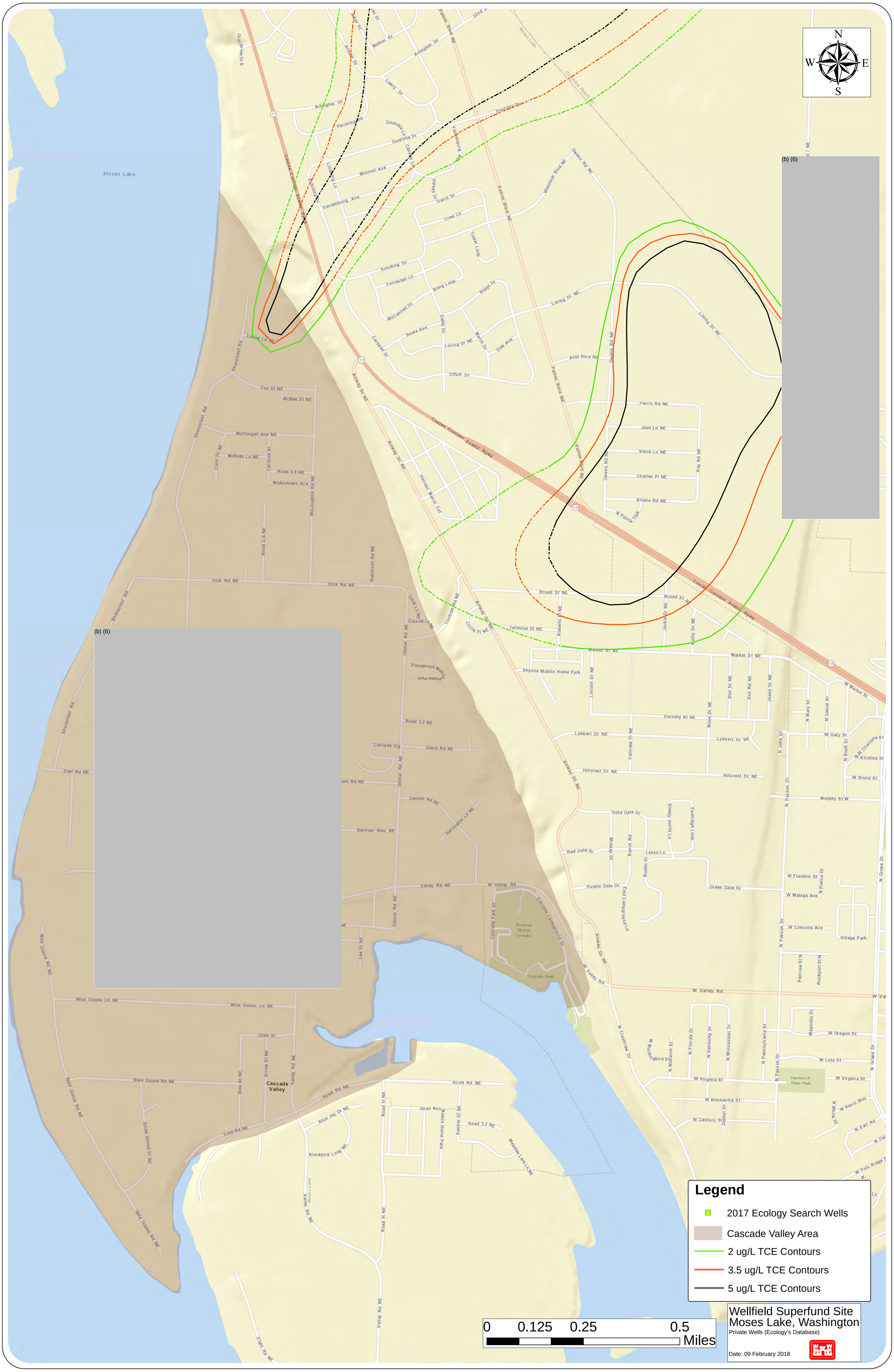

Figure 11. Map of Private Wells (Ecology's Database)

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Tables

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Table 1. Wells Sampled during 2017 Sampling Year

	January 2017		June 2017		August 2017	
Well ID	**COC**	**GW. Elevation**	**COC**	**GW. Elevation**	**COC**	**GW. Elevation**
Hanford Formation Wells						
00AW11	x	x				
91AW07	x	x				
91AW09	x	x				
91AW14			x	x		
91AW15	x	x				
91AW17			x	x		
99AW01	x	x				
99AW08	x	x				
99AW09	x	x				
Priest Rapids/Roza 1 Wells						
00BW01	x	x				
00BW02	x	x				
00BW03	x	x				
00BW04			x	x		
00BW05	x	x				
00BW06	x	x				
00BW07	x	x				
00BW09	x	x				
00BW10	x	x				
00BW11	x	x				
00BW12	x	x				
00BW13	x	x				
00BW14			x	x		
00BW15	x	x				
00BW16	x	x				
01BW01	x	x				
02BW01	x	x				
02BW02	x	x				
04BW01	x	x				
04BW04	x	x				
04BW05	x	x				
04BW06	x	x				
04BW07	x	x				
04BW09	x	x				
12BW01	x	x				
12BW02	x	x				
12BW03A	x	x				
12BW03B						
12BW04A	x	x				

	January 2017		June 2017		August 2017	
Well ID	**COC**	**GW. Elevation**	**COC**	**GW. Elevation**	**COC**	**GW. Elevation**
12BW04B						
12BW05	x	x				
12BW06	x	x				
12BW07	x	x				
12BW08	x	x				
14BW01	x	x				
14BW02	x	x				
14BW03	x	x				
91BW02			x	x		
91BW03	x	x				
91BW04			x	x		
92BW01	x	x				
92BW02	x	x				
99BW01	x	x				
99BW09	x	x				
99BW10	x	x				
99BW11	x	x				
99BW12	x	x				
99BW14	x	x				
99BW15	x	x				
99BW16	x	x				
99BW18	x	x				
16BW01			x	x		
16BW02			x	x		
Roza 2 Wells						
04CW01	x	x				
04CW02	x	x				
04CW03	x	x				
04CW04	x	x				
04CW05	x	x				
04CW07A	x	x				
04CW07B						
04CW08						
12CW01	x	x				
12CW02	x	x				
12CW03			x	x		
12CW04	x	x				
12CW05	x	x				
16CW01			x	x		
16CW02			x	x		
16CW03			x	x		

	January 2017		June 2017		August 2017	
Well ID	**COC**	**GW. Elevation**	**COC**	**GW. Elevation**	**COC**	**GW. Elevation**
Extraction Wells						
12EX01	x	x				
12EX02	x	x				
14EX03	x	x				
14EX04	x	x				
14EX05	x	x				
Private Wells						
WP-03	x				x	
WP-04	x					
WP-09					x	
WP-10					x	
WP-105					x	
WP-111					x	
WP-116	x					
WP-118					x	
WP-119					x	
WP-120					x	
WP-121					x	
WP-122					x	
WP-123					x	
WP-124	x					
WP-125	x					
WP-126					x	
WP-127						
WP-128					x	
WP-129	x					
WP-130					x	
WP-131					x	
WP-136	x				x	
WP-137	x				x	
WP-138					x	
WP-139					x	
WP-14					x	
WP-143						
WP-144					x	
WP-145					x	
WP-147					x	
WP-148					x	
WP-149					x	
WP-150					x	
WP-152					x	

	January 2017		June 2017		August 2017	
Well ID	COC	GW. Elevation	COC	GW. Elevation	COC	GW. Elevation
WP-153					x	
WP-154					x	
WP-155					x	
WP-156					x	
WP-165					x	
WP-167					x	
WP-168					x	
WP-169	x				x	
WP-170					x	
WP-171					x	
WP-172					x	
WP-173					x	
WP-175					x	
WP-176	x				x	
WP-177					x	
WP-178					x	
WP-179					x	
WP-180						
WP-181					x	
WP-182					x	
WP-183					x	
WP-25W					x	
WP-27						
WP-28	x					
WP-33						
WP-45					x	
WP-50					x	
WP-52					x	
WP-54					x	
WP-57					x	
WP-65					x	
WP-66	x				x	
WP-68					x	
WP-69	x				x	
WP-70					x	
WP-71A					x	
WP-71B					x	
WP-74	x				x	
WP-82					x	
WP-83					x	
WP-86	x					

Table 2. Private Wells with Whole-House Filter Systems

WELL ID	Date WHF System Installed/Replaced	Comment
WP-14	May 2013	Replaced WHF from mid-2000s
WP-70	May 2013	Replaced WHF from mid-2000s
WP-82	Removed	Was installed in early 2000s though no detections exceeded action threshold; was removed in 2013 because results continued to be less than action threshold.
WP-83	May 2013	Replaced WHF from mid-2000s
WP-86	May 2013	Replaced WHF from mid-2000s
WP-119	Aug 2013	
WP-121	Aug 2013	
WP-129	Sep 2013	
WP-124	Oct 2013	
WP-123	Sep 2014	
WP-125	Apr 2015	

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Table 3. Monitoring Wells – Groundwater Elevations

Well ID	Depth to Water Jan 2017	Water Level Elevation Jan 2017	Depth to Water May 2017	Water Level Elevation May 2017	Depth to Water June 2017	Water Level Elev. June 2017	Screen Interval	Bladder Pump Installed?	Stick Up or Flush Mount	NAD 83 Coordinates	
00AW11	83.89	1073.77	nm		nm		81-91	Yes	Stick Up	47.180903	-119.30661
00BW01	47.6	1082.45	nm		nm		68-78	Yes	Stick Up	47.190079	-119.28616
00BW02	84.87	1076.49	nm		nm		87-97	Yes	Stick Up	47.182638	-119.306417
00BW03	82.09	1077.63	nm		nm		85-95	Yes	Stick Up	47.185409	-119.303345
00BW04	nm		63.3	1086.67	62.97	1087	70-80	Yes	Stick Up	47.192445	-119.298192
00BW05	64.91	1086.74	nm		nm		80-90	Yes	Stick Up	47.195435	-119.294518
00BW06	146.52	1052.4	nm		nm		180-190	Yes	Stick Up	47.189802	-119.338849
00BW07	69.13	1081.1	nm		nm		75-85	Yes	Stick Up	47.192043	-119.301497
00BW09	70.86	1086.21	nm		nm		79.5-89.5	Yes	Stick Up	47.196831	-119.301469
00BW10	136.38	1032.91	nm		nm		186.2-196.2	Yes	Stick Up	47.147826	-119.307873
00BW11	91.41	1073.37	nm		nm		107-117	Yes	Flush Mount	47.188424	-119.317939
00BW12	80	1076.68	nm		nm		101-111	Yes	Stick Up	47.188245	-119.304851
00BW13	85.04	1069.18	nm		nm		133-143	Yes	Stick Up	47.165764	-119.301631
00BW14	nm		nm		55.4	1085.53	62-72	Yes	Flush Mount	47.191362	-119.288309
00BW15	79.75	1073.71	nm		nm		105.6-115.6	Yes	Stick Up	47.177595	-119.299711
00BW16	134	1046.04	nm		nm		186.4-196.4	Yes	Stick Up	47.160398	-119.319182
01BW01	65.75	1087.18	nm		nm		85-95	Yes	Flush Mount	47.196578	-119.295897
02BW01	130.4	1044.46	nm		nm		188-192.5	Removed	Flush Mount	47.154543	-119.309278
02BW02	69.31	1075.43	nm		nm		109-118.5	Yes	Flush Mount	47.182746	-119.295425
04BW01	64.99	1086.95	nm		nm		96-116	No	Stick Up	47.196733	-119.295632
04BW04	137.71	1057.28	nm		nm		190-210	No	Stick Up	47.186124	-119.331118
04BW05	129.74	1062.1	nm		nm		176-196	No	Stick Up	47.179966	-119.328492
04BW06	105.3	1065.7	nm		nm		174-194	No	Stick Up	47.178499	-119.316265
04BW07	125.13	1057.87	nm		nm		195-215	No	Stick Up	47.164316	-119.313303
04BW09	85.33	1069.25	nm		nm		139.5-149.5	No	Flush Mount	47.16529	-119.303267
04CW01	161.5	1032.69	nm		nm		298-308	No	Stick Up	47.186125	-119.330888
04CW02	162.24	1029.75	nm		nm		297-307	No	Stick Up	47.180036	-119.328547
04CW03	136.7	1025.79	nm		nm		264-284	No	Stick Up	47.180214	-119.311653
04CW04	126.65	1057.2	nm		nm		303-313	No	Stick Up	47.16437	-119.313331

Well ID	Depth to Water Jan 2017	Water Level Elevation Jan 2017	Depth to Water May 2017	Water Level Elevation May 2017	Depth to Water June 2017	Water Level Elev. June 2017	Screen Interval	Bladder Pump Installed?	Stick Up or Flush Mount	NAD 83 Coordinates	
04CW05	98.81	1057.18	nm		nm		260-280	No	Stick Up	47.163731	-119.304417
04CW07	144.47	1031.73	nm		nm		283-293/ 303-309	No	Stick Up	47.155184	-119.309159
12BW01	85.31	1073.16	nm		nm		162 - 172	No	Stick Up	47.168105	-119.301971
12BW02	114.84	1053.96	nm		nm		174 - 194	No	Flush Mount	47.156722	-119.305516
12BW03	127.09	1059.95	nm		nm		179-189/ 199-219	No	Stick Up	47.160178	-119.312552
12BW04	99.32	1069.7	nm		nm		158-168/178-188	No	Stick Up	47.165106	-119.307067
12BW05	90.14	1070.94	nm		nm		167 - 187	No	Stick Up	47.162973	-119.303437
12BW06	116.22	1058.43	nm		nm		170 - 200	No	Flush Mount	47.158669	-119.309139
12BW07	89.52	1072.44	nm		nm		160 - 180	No	Stick Up	47.16467	-119.303665
12BW08	118.09	1054.41	nm		nm		178 - 198	No	Flush Mount	47.156729	-119.307772
12CW01	133.7	1035.23	nm		nm		274 - 294	No	Flush Mount	47.156724	-119.30559
12CW02	151.62	1035.48	nm		nm		300 - 320	No	Stick Up	47.16022	-119.312575
12CW03	108.32	1060.71	107.15	1061.88	108.29	1060.74	288-298	No	Stick Up	47.165098	-119.306996
12CW04	101.04	1060.03	nm		nm		255 - 265	No	Stick Up	47.16294	-119.303394
12CW05	138.73	1035.39	nm		nm		287 - 307	No	Flush Mount	47.158672	-119.309
12EX01	89.54	1072.47	nm		nm		160 - 180	No	Stick Up	47.16465	-119.30358
12EX02	117.92	1054.68	nm		nm		180 - 198	No	Flush Mount	47.156733	-119.307692
14BW01	95.3	1070.79	nm		nm		160-180	No	Stick Up	47.163858	-119.305713
14BW02	106.45	1062.93	nm		nm		157-187	No	Stick Up	47.162105	-119.306092
14BW03	87.5	1072.78	nm		nm		143-173	No	Stick Up	47.166044	-119.304279
14EX03	95.65	1070.47	nm		nm		160-180	No	Stick Up	47.163859	-119.305689
14EX04	106.44	1063.23	nm		nm		157-187	No	Stick Up	47.162104	-119.306073
14EX05	87.44	1072.74	nm		nm		143-173	No	Stick Up	47.166044	-119.304263
16BW01	nm		136.15	1049.9	139.59	1046.46		No	Flush Mount		
16BW02	nm		145.5	1040.6	150.57	1035.53		No	Flush Mount		
16CW01	nm		150.15	1036.05	157.09	1029.11		No	Flush Mount		
16CW02	nm		150.71	1035.49	156.98	1029.22		No	Flush Mount		
16CW03	nm		143.8	1036.51	150.43	1029.88		No	Flush Mount		

Well ID	Depth to Water Jan 2017	Water Level Elevation Jan 2017	Depth to Water May 2017	Water Level Elevation May 2017	Depth to Water June 2017	Water Level Elev. June 2017	Screen Interval	Bladder Pump Installed?	Stick Up or Flush Mount	NAD 83 Coordinates	
91AW07	87.78	1074.28	nm		nm		81-101	No	Stick Up	47.180598	-119.311535
91AW09	37.69	1124.11	nm		nm		81-101	Yes	Stick Up	47.179826	-119.31241
91AW14	nm		nm		121.7	1064.99	116-136	No	Stick Up	47.188512	-119.327511
91AW15	90.73	1073.85	nm		nm		89-109	Yes	Flush Mount	47.188513	-119.317936
91AW17	nm		nm		117	1071.32	108-128	Yes	Stick Up	47.179675	-119.326143
91BW02	nm		89.5	1079.95	88.82	1080.63	137-147	Yes	Stick Up	47.192871	-119.315772
91BW03	89.14	1073.22	nm		nm		170-180	Yes	Stick Up	47.180218	-119.312071
91BW04	nm		nm		83.81	1068.31	178-188	Yes	Stick Up	47.171379	-119.307337
92BW01							143-153	Yes	Stick Up	47.18096	-119.306561
92BW02	89.2	1066.62	nm		nm		147-157	Yes	Stick Up	47.179523	-119.305986
99AW01	88.34	1074.3	nm		nm		101-111	Yes	Stick Up		
99AW08	69.68	1075.28	nm		nm		70-80	Yes	Flush Mount	47.182757	-119.295516
99AW09	98.29	1063.33	nm		nm		97.5-107.5	Yes	Stick Up	47.160705	-119.304635
99BW01	89.2	1073.35	nm		nm		141.5-151.5	Yes	Stick Up	47.180311	-119.311651
99BW09	73	1033.43	nm		nm		110-120	Yes	Stick Up	47.150603	-119.293789
99BW10	130.2	1044.79	nm		nm		175-185	Yes	Flush Mount	47.15475	-119.3095
99BW11	50.97	1035.19	nm		nm		102-112	Yes	Flush Mount	47.153011	-119.325283
99BW12	112.52	1065.49	nm		nm		162-172	Yes	Flush Mount	47.174589	-119.319677
99BW14	54.7	1071.84	nm		nm		85-95	Yes	Stick Up	47.16798	-119.294074
99BW15	70	1075.05	nm		nm		90-100	Yes	Flush Mount	47.182758	-119.295615
99BW16	123.23	1064.13	nm		nm		146-156	Yes	Stick Up	47.188514	-119.327413
99BW18	104.21	1057.38	nm		nm		143-153	Yes	Stick Up	47.160705	-119.304635

Notes:

nm indicates depth to water was not measured.

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Table 4. Monitoring and Extraction Wells – Sampling Results

Well ID	Sample ID	Sample Date	Sample Type	CIS-1,2-DICHLOROETHENE		TRICHLOROETHENE	
				MCL: 70 µg/L		MCL: 5 µg/L	
				Result	Qualifier	Result	Qualifier
Hanford Formation Wells							
00AW11	1701N00AW11	1/26/2017	N	< 0.20	U	1.66	
91AW07	1701N91AW07	1/24/2017	N	< 0.20	U	< 0.20	U
91AW09	1701N91AW09	1/26/2017	N	< 0.20	U	< 0.20	U
91AW14	1705N91AW14	6/7/2017	N	< 0.20	U	0.76	
91AW15	1701N91AW15	1/25/2017	N	< 0.20	U	< 0.20	U
91AW17	1705N91AW17	6/7/2017	N	< 0.20	U	0.14	J
99AW01	1701N99AW01	1/26/2017	N	< 0.20	U	0.13	J
99AW08	1701N99AW08	1/24/2017	N	< 0.20	U	< 0.20	U
99AW08	1701D99AW08	1/24/2017	FD	< 0.20	U	< 0.20	U
99AW09	1701N99AW09	1/27/2017	N	< 0.20	U	2.28	
Priest Rapids/ Roza 1 Wells							
00BW01	1701N00BW01	1/23/2017	N	< 0.20	U	< 0.20	U
00BW01	1701D00BW01	1/23/2017	FD	< 0.20	U	< 0.20	U
00BW02	1701N00BW02	1/25/2017	N	< 0.20	U	< 0.20	U
00BW03	1701N00BW03	1/25/2017	N	< 0.20	U	< 0.20	U
00BW04	1705N00BW04	6/7/2017	N	< 0.20	U	< 0.20	U
00BW05	1701N00BW05	1/24/2017	N	< 0.20	U	< 0.20	U
00BW06	1701N00BW06	1/25/2017	N	< 0.20	U	0.11	J
00BW07	1701N00BW07	1/24/2017	N	< 0.20	U	< 0.20	U
00BW07	1701D00BW07	1/24/2017	FD	< 0.20	U	< 0.20	U
00BW09	1701N00BW09	1/24/2017	N	< 0.20	U	< 0.20	U
00BW10	1701N00BW10	1/28/2017	N	< 0.20	U	< 0.20	U
00BW11	1701N00BW11	1/25/2017	N	< 0.20	U	< 0.20	U
00BW12	1701N00BW12	1/25/2017	N	< 0.20	U	16.2	
00BW13	1701N00BW13	1/27/2017	N	< 0.20	U	< 0.20	U
00BW14	1705N00BW14	6/7/2017	N	< 0.20	U	< 0.20	U
00BW14	1705D00BW14	6/7/2017	FD	< 0.20	U	< 0.20	U
00BW15	1701N00BW15	1/26/2017	N	0.39		1.86	
00BW16	1701N00BW16	1/27/2017	N	< 0.20	U	< 0.20	U
01BW01	1701N01BW01	1/24/2017	N	< 0.20	U	< 0.20	U
01BW01	1701D01BW01	1/24/2017	FD	< 0.20	U	< 0.20	U
02BW01	1701N02BW01	1/23/2017	N	< 0.20	U	12.2	
02BW02	1701N02BW02	1/24/2017	N	< 0.20	U	< 0.20	U
04BW01	1701N04BW01	1/24/2017	N	< 0.20	U	< 0.20	U
04BW04	1701N04BW04	1/24/2017	N	< 0.20	U	0.26	
04BW05	1701N04BW05	1/24/2017	N	< 0.20	U	1.24	

Well ID	Sample ID	Sample Date	Sample Type	CIS-1,2-DICHLOROETHENE		TRICHLOROETHENE	
				MCL: 70 µg/L		MCL: 5 µg/L	
				Result	Qualifier	Result	Qualifier
04BW06	1701N04BW06	1/24/2017	N	2.25		11.5	
04BW07	1701N04BW07	1/24/2017	N	< 0.20	U	< 0.20	U
04BW09	1701N04BW09	1/25/2017	N	< 0.20	U	45.3	
12BW01	1701N12BW01	1/24/2017	N	< 0.20	U	< 0.20	U
12BW02	1701N12BW02	1/26/2017	N	< 0.20	U	7.37	
12BW03	1701N12BW03A	1/25/2017	N	< 0.20	U	0.92	
12BW03	1701N12BW03B	1/25/2017	N	< 0.20	U	0.52	
12BW04	1701N12BW04A	1/25/2017	N	< 0.20	U	19.7	
12BW04	1701N12BW04B	1/25/2017	N	< 0.20	U	18.8	
12BW05	1701N12BW05	1/24/2017	N	< 0.20	U	85.4	
12BW06	1701N12BW06	1/25/2017	N	< 0.20	U	6.06	
12BW07	1701N12BW07	1/25/2017	N	< 0.20	U	73.6	
12BW08	1701N12BW08	1/26/2017	N	< 0.20	U	8.17	
14BW01	1701N14BW01	1/25/2017	N	< 0.20	U	59.5	
14BW02	1701N14BW02	1/25/2017	N	< 0.20	U	18.1	
14BW03	1701N14BW03	1/25/2017	N	< 0.20	U	9.99	
16BW01	1705N16BW0101	6/6/2017	N	< 0.20	U	3.11	
16BW01	1705N16BW0102	6/6/2017	N	< 0.20	U	4.31	
16BW01	1705N16BW0103	6/6/2017	N	< 0.20	U	7.15	
16BW02	1705N16BW0207	6/6/2017	N	< 0.20	U	0.20	
16BW02	1705D16BW0216	6/6/2017	FD	< 0.20	U	0.11	J
16BW02	1705N16BW0208	6/6/2017	N	< 0.20	U	0.29	
16BW02	1705N16BW0209	6/6/2017	N	< 0.20	U	0.22	
91BW02	1705N91BW02	6/7/2017	N	< 0.20	U	< 0.20	U
91BW03	1701N91BW03	1/26/2017	N	< 0.20	U	31.1	
91BW04	1705N91BW04	6/7/2017	N	< 0.20	U	0.12	J
92BW01	1701N92BW01	1/26/2017	N	< 0.20	U	23.0	
92BW02	1701N92BW02	1/26/2017	N	0.82		7.18	
99BW01	1701N99BW01	1/26/2017	N	< 0.20	U	29.8	
99BW09	1701N99BW09	1/27/2017	N	< 0.20	U	< 0.20	U
99BW10	1701N99BW10	1/27/2017	N	< 0.20	U	11.2	
99BW11	1701N99BW11	1/28/2017	N	< 0.20	U	0.10	J
99BW12	1701B99BW12	1/23/2017	N	< 0.20	U	0.43	
99BW14	1701N99BW14	1/27/2017	N	< 0.20	U	< 0.20	U
99BW15	1701N99BW15	1/24/2017	N	1.50		7.06	
99BW16	1701N99BW16	1/23/2017	N	< 0.20	U	1.49	
99BW18	1701N99BW18	1/27/2017	N	< 0.20	U	7.09	
Roza 2 Wells							
04CW01	1701N04CW01	1/24/2017	N	< 0.20	U	0.53	

Well ID	Sample ID	Sample Date	Sample Type	CIS-1,2-DICHLOROETHENE		TRICHLOROETHENE	
				MCL: 70 µg/L		MCL: 5 µg/L	
				Result	Qualifier	Result	Qualifier
04CW02	1701D04CW02	1/24/2017	FD	< 0.20	U	< 0.20	U
04CW02	1701N04CW02	1/24/2017	N	< 0.20	U	< 0.20	U
04CW03	1701N04CW03	1/24/2017	N	< 0.20	U	1.54	
04CW04	1701N04CW04	1/24/2017	N	< 0.20	U	0.46	
04CW05	1701N04CW05	1/24/2017	N	< 0.20	U	2.17	
04CW07	1701N04CW07A	1/23/2017	N	< 0.20	U	5.89	
04CW07	1701N04CW07B	1/23/2017	N	< 0.20	U	5.46	
12CW01	1701N12CW01	1/26/2017	N	< 0.20	U	3.57	
12CW02	1701N12CW02	1/25/2017	N	< 0.20	U	0.31	
12CW03	1705N12CW03	6/7/2017	N	< 0.20	U	0.34	
12CW04	1701N12CW04	1/24/2017	N	< 0.20	U	0.55	
12CW04	1701D12CW04	1/24/2017	FD	< 0.20	U	0.58	
12CW05	1701N12CW05	1/25/2017	N	< 0.20	U	0.56	
16CW01	1705D16CW0115	6/6/2017	FD	< 0.20	U	3.92	
16CW01	1705N16CW0104	6/6/2017	N	< 0.20	U	3.95	
16CW01	1705N16CW0105	6/6/2017	N	< 0.20	U	4.00	
16CW01	1705N16CW0106	6/6/2017	N	< 0.20	U	2.73	
16CW02	1705N16CW0210	6/6/2017	N	0.71		2.26	
16CW02	1705N16CW0212	6/6/2017	N	0.68		1.71	
16CW02	1705N16CW0211	6/6/2017	N	0.95		1.95	
16CW03	1705N16CW0313	6/6/2017	N	< 0.20	U	0.28	
16CW03	1705N16CW0314	6/6/2017	N	< 0.20	U	0.26	
Extraction Wells							
12EX01	1701N12EX01	1/25/2017	N	0.22		4.89	
12EX02	1701N12EX02	1/26/2017	N	< 0.20	U	4.38	
14EX03	1701N14EX03	1/25/2017	N	0.40		38.0	
14EX04	1701N14EX04	1/25/2017	N	< 0.20	U	17.7	
14EX05	1701N14EX05	1/25/2017	N	0.16	J	4.35	

Cells shaded red exceed 5.0 ug/L TCE MCL risk level.

N -Normal Sample
FD -Field Duplicate
U -Undetected
J -
Estimated
MCL-Maximum Contaminant Level

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Table 5. Private Wells without WHFs – Sampling Results

PRIVATE WELL WITHOUT WHF - RESULTS				CIS-1,2-DICHLOROETHENE MCL: 70 µg/L		TRICHLOROETHENE MCL: 5 µg/L	
Well ID	Sample Name	Sample Date	Sample Type	Result	Qualifier	Result	Qualifier
WP-03	1701NWP03	1/23/2017	N	0.21		1.08	
WP-03	1708NWP03	8/21/2017	N	0.30		1.22	
WP-04	1701NWP04	1/23/2017	N	1.98		5.65	
WP-09	1708NWP09	8/22/2017	N	< 0.20	U	< 0.20	U
WP-10	1708NWP10	8/22/2017	N	< 0.20	U	0.08	J
WP-105	1708NWP105	8/22/2017	N	< 0.20	U	0.45	
WP-111	1708NWP111	8/22/2017	N	< 0.20	U	0.26	
WP-116	1701NWP116	1/23/2017	N	0.42		1.54	
WP-116	1701DWP116	1/23/2017	FD	0.44		1.68	
WP-118	1708NWP118	8/21/2017	N	< 0.20	U	1.16	
WP-120	1708NWP120	8/22/2017	N	< 0.20	U	0.35	
WP-122	1708NWP122	8/22/2017	N	< 0.20	U	0.61	
WP-122	1708DWP122	8/22/2017	FD	< 0.20	U	0.63	
WP-126	1708NWP126	8/22/2017	N	< 0.20	U	1.07	
WP-128	1708NWP128	8/22/2017	N	< 0.20	U	0.49	
WP-130	1708NWP130	8/22/2017	N	< 0.20	U	< 0.20	U
WP-131	1708NWP131	8/23/2017	N	< 0.20	UJ	1.54	J-
WP-131	1708DWP131	8/23/2017	FD	< 0.20	UJ	1.52	J-
WP-136	1701NWP136	1/23/2017	N	< 0.20	U	1.27	
WP-136	1708NWP136	8/21/2017	N	< 0.20	U	1.15	
WP-136	1708DWP136	8/21/2017	FD	< 0.20	U	1.23	
WP-137	1701NWP137	1/23/2017	N	0.10	J	0.50	
WP-137	1708NWP137	8/21/2017	N	< 0.20	U	1.21	
WP-138	1708NWP138	8/21/2017	N	< 0.20	U	0.64	
WP-139	1708NWP139	8/21/2017	N	< 0.20	U	0.79	
WP-144	1708NWP144	8/22/2017	N	< 0.20	U	0.33	
WP-145	1708NWP145	8/22/2017	N	< 0.20	U	0.26	
WP-147	1708NWP147	8/22/2017	N	< 0.20	U	0.19	J
WP-148	1708NWP148	8/22/2017	N	< 0.20	U	0.18	J
WP-149	1708NWP149	8/22/2017	N	< 0.20	U	0.11	J
WP-150	1708NWP150	8/22/2017	N	< 0.20	U	0.10	J
WP-150	1708DWP150	8/22/2017	FD	< 0.20	U	< 0.20	U
WP-152	1708NWP152	8/22/2017	N	< 0.20	U	0.28	
WP-153	1708NWP153	8/22/2017	N	< 0.20	U	0.38	

PRIVATE WELL WITHOUT WHF - RESULTS				CIS-1,2-DICHLOROETHENE		TRICHLOROETHENE	
				MCL: 70 µg/L		MCL: 5 µg/L	
Well ID	Sample Name	Sample Date	Sample Type	Result	Qualifier	Result	Qualifier
WP-154	1708NWP154	8/22/2017	N	< 0.20	U	0.37	
WP-155	1708NWP155	8/22/2017	N	< 0.20	U	0.24	
WP-156	1708NWP156	8/22/2017	N	< 0.20	U	0.45	
WP-165	1708NWP165	8/22/2017	N	< 0.20	U	< 0.20	U
WP-167	1708NWP167	8/22/2017	N	< 0.20	U	2.54	
WP-168	1708NWP168	8/22/2017	N	< 0.20	U	2.40	
WP-169	1701NWP169	1/23/2017	N	< 0.20	U	0.93	
WP-169	1708NWP169	8/23/2017	N	< 0.20	U	1.00	
WP-170	1708NWP170	8/23/2017	N	< 0.20	U	0.25	
WP-171	1708NWP171	8/23/2017	N	< 0.20	U	< 0.20	U
WP-171	1708DWP171	8/23/2017	FD	< 0.20	U	< 0.20	U
WP-172	1708NWP172	8/21/2017	N	< 0.20	U	0.83	
WP-173	1708NWP173	8/23/2017	N	< 0.20	U	< 0.20	U
WP-175	1708NWP175	8/22/2017	N	< 0.20	UJ	0.12	J
WP-176	1701NWP176	1/27/2017	N	< 0.20	U	0.34	
WP-176	1708NWP176	8/22/2017	N	< 0.20	U	0.38	
WP-177	1708NWP177	8/21/2017	N	< 0.20	U	< 0.20	U
WP-178	1708NWP178	8/23/2017	N	< 0.20	U	0.34	
WP-179	1708NWP179	8/22/2017	N	< 0.20	U	< 0.20	U
WP-181	1708DWP181	8/23/2017	FD	< 0.20	UJ	0.12	J
WP-181	1708NWP181	8/23/2017	N	< 0.20	U	0.14	J
WP-182	1708NWP182	8/22/2017	N	< 0.20	U	0.32	
WP-183	1708NWP183	8/23/2017	N	< 0.20	UJ	< 0.20	UJ
WP-25W	1708NWP25W	8/23/2017	N	< 0.20	UJ	0.64	J-
WP-28	1701NWP28	1/26/2017	N	< 0.20	U	0.09	J
WP-28	1701DWP28	1/26/2017	FD	< 0.20	U	0.09	J
WP-45	1708NWP45	8/21/2017	N	< 0.20	U	0.92	
WP-50	1708NWP50	8/21/2017	N	< 0.20	U	< 0.20	U
WP-52	1708NWP52	8/21/2017	N	< 0.20	U	0.10	J
WP-54	1708NWP54	8/21/2017	N	< 0.20	U	0.07	J
WP-54	1708DWP54	8/21/2017	FD	< 0.20	U	< 0.20	U
WP-57	1708NWP57	8/21/2017	N	< 0.20	U	0.49	
WP-65	1708NWP65	8/21/2017	N	< 0.20	U	0.60	
WP-66	1701NWP66	1/23/2017	N	0.39		1.72	
WP-66	1708NWP66	8/21/2017	N	0.40		1.89	
WP-68	1708NWP68	8/21/2017	N	0.12	J	0.73	

PRIVATE WELL WITHOUT WHF - RESULTS				CIS-1,2-DICHLOROETHENE		TRICHLOROETHENE	
				MCL: 70 µg/L		MCL: 5 µg/L	
Well ID	Sample Name	Sample Date	Sample Type	Result	Qualifier	Result	Qualifier
WP-69	1701NWP69	1/23/2017	N	< 0.20	U	0.58	
WP-69	1708NWP69	8/21/2017	N	< 0.20	U	1.58	
WP-69	1708DWP69	8/21/2017	FD	0.15	J	1.72	
WP-71A	1708NWP71A	8/22/2017	N	< 0.20	U	0.18	J
WP-71B	1708NWP71B	8/22/2017	N	< 0.20	U	0.35	
WP-74	1701NWP74	1/23/2017	N	< 0.20	U	1.26	
WP-74	1708NWP74	8/22/2017	N	< 0.20	U	1.30	
WP-82	1708NWP82	8/23/2017	N	< 0.20	U	0.10	J

Cells shaded red exceeded 5.0 ug/L TCE MCL risk level. This well does not have a WHF system because water is used for industrial purposes only.

N -Normal Sample
FD -Field Duplicate
U -Undetected
J -
Estimated
MCL-Maximum Contaminant Level

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Table 6. Private Wells with WHFs- Analytical Results

NOTE: Effluent results in all cases were <0.20 µg/L for cis-DCE and TCE and therefore are not shown. Only one well (WP-14) had detections above 0.20 µg/L at the mid port and therefore only mid results for this well are shown.

PRIVATE WHF WELL RESULTS					CIS-1,2-DICHLOROETHENE MCL: 70 µg/L		TRICHLOROETHENE MCL: 5 µg/L	
Well ID	Sample Name	Sample Date	Sample Type	Sample Location	Result	Qualifier	Result	Qualifier
WP-119	1708NWP119A1	8/21/2017	N	Influent	0.24		3.52	
WP-121	1708NWP121A1	8/21/2017	N	Influent	0.20		4.36	
WP-121	1708DWP121A1	8/21/2017	FD	Influent	0.20		3.91	
WP-123	1708NWP123A1	8/22/2017	N	Influent	0.26		2.50	
WP-124	1701NWP124A1	1/23/2017	N	Influent	1.55		5.68	J-
WP-124	1701DWP124A1	1/23/2017	FD	Influent	1.35		5.51	
WP-125	1701NWP125A1	1/26/2017	N	Influent	0.94		3.61	
WP-129	1701NWP129A1	1/23/2017	N	Influent	0.11	J	3.57	
WP-129	1701DWP129A1	1/23/2017	FD	Influent	< 0.20	U	3.05	
WP-14	1708NWP14A1	8/22/2017	N	Influent	0.82		2.53	
WP-14	1708NWP14C1	8/22/2017	N	Mid	1.02		0.39	
WP-70	1708NWP70A1	8/23/2017	N	Influent	0.34	J-	3.41	J-
WP-83	1708NWP83A1	8/22/2017	N	Influent	0.23		1.66	
WP-86	1701NWP86A1	1/23/2017	N	Influent	< 0.20	U	2.53	

Cells shaded red exceeded 5.0 ug/L TCE MCL risk level. This well does not have a WHF system because water is used for industrial purposes only.

Sample ID locations are as follows:

A-influent before lead, B- in between lead and lag filter (mid), C - effluent after lag

N -Normal Sample

FD -Field Duplicate

U -Undetected

J -Estimated

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Table 7. Whole House Filters – Purge and Totalizer Volume Summary

Date	Well System	Flow Meter Initial (Gal)	Flow Meter Final (Gal)
Event 1 January 2017			
1/23/2017	**WP-86**	740,896	740,900
1/23/2017	**WP-124**	337,337	337,342
1/23/2017	**WP-129**	195,994	196,000
1/23/2017	**WP-125**	70	75
Event 2 August 2017			
8/21/2017	**WP-119**	271,273	271,278
8/21/2017	**WP-121**	128,299	128,304
8/22/2017	**WP-83**	3,076,258	3,076,263
8/22/2017	**WP-14**	2,692,388	2,692,393
8/22/2017	**WP-123**	430,376	430,381
8/23/2017	**WP-70**	324,412	324,417

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APPENDIX A - Field Sampling Reports (CD only)

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APPENDIX B – Comprehensive 2017 Analytical Results

			Chemical Name	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	CIS-1,2-DCE	TRANS-1,2-DCE	TCE	VC
			Analysis Method	EPA Method 524.3							
			CAS RN	71-55-6	75-34-3	75-35-4	107-06-2	156-59-2	156-60-5	79-01-6	75-01-4
			Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Well ID	Sample Name	Sample Type	Sample Date								
Monitoring Wells											
00AW11	1701N00AW11	N	1/26/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.66	0.10 U
00BW01	1701D00BW01	FD	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
00BW01	1701N00BW01	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
00BW02	1701N00BW02	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
00BW03	1701N00BW03	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
00BW04	1705N00BW04	N	6/7/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
00BW05	1701N00BW05	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
00BW06	1701N00BW06	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 J	0.10 U
00BW07	1701D00BW07	FD	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
00BW07	1701N00BW07	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
00BW09	1701N00BW09	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
00BW10	1701N00BW10	N	1/28/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
00BW11	1701N00BW11	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
00BW12	1701N00BW12	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	16.2	0.10 U
00BW13	1701N00BW13	N	1/27/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
00BW14	1705D00BW14	FD	6/7/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
00BW14	1705N00BW14	N	6/7/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
00BW15	1701N00BW15	N	1/26/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.39	0.10 U	1.86	0.10 U
00BW16	1701N00BW16	N	1/27/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
01BW01	1701D01BW01	FD	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
01BW01	1701N01BW01	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
02BW01	1701N02BW01	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	12.2	0.10 U
02BW02	1701N02BW02	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
04BW01	1701N04BW01	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
04BW04	1701N04BW04	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.26	0.10 U
04BW05	1701N04BW05	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.24	0.10 U
04BW06	1701N04BW06	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	2.25	0.10 U	11.5	0.10 U
04BW07	1701N04BW07	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
04BW09	1701N04BW09	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	48.7	0.10 U

			Chemical Name	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	CIS-1,2-DCE	TRANS-1,2-DCE	TCE	VC
			Analysis Method	EPA Method 524.3							
			CAS RN	71-55-6	75-34-3	75-35-4	107-06-2	156-59-2	156-60-5	79-01-6	75-01-4
			Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Well ID	Sample Name	Sample Type	Sample Date								
04CW01	1701N04CW01	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.53	0.10 U
04CW02	1701D04CW02	FD	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
04CW02	1701N04CW02	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
04CW03	1701N04CW03	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.54	0.10 U
04CW04	1701N04CW04	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.46	0.10 U
04CW05	1701N04CW05	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	2.17	0.10 U
04CW07	1701N04CW07A	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	5.89	0.10 U
04CW07	1701N04CW07B	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	5.46	0.10 U
12BW01	1701N12BW01	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
12BW02	1701N12BW02	N	1/26/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	7.37	0.10 U
12BW03	1701N12BW03A	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.92	0.10 U
12BW03	1701N12BW03B	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.52	0.10 U
12BW04	1701N12BW04A	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	19.7	0.10 U
12BW04	1701N12BW04B	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	18.8	0.10 U
12BW05	1701N12BW05	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	89.0	0.10 U
12BW06	1701N12BW06	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	6.06	0.10 U
12BW07	1701N12BW07	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	77.1	0.10 U
12BW08	1701N12BW08	N	1/26/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	8.17	0.10 U
12CW01	1701N12CW01	N	1/26/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	3.57	0.10 U
12CW02	1701N12CW02	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.31	0.10 U
12CW03	1705N12CW03	N	6/7/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.34	0.10 U
12CW04	1701D12CW04	FD	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.58	0.10 U
12CW04	1701N12CW04	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.55	0.10 U
12CW05	1701N12CW05	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.56	0.10 U
12EX01	1701N12EX01	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.22	0.10 U	4.89	0.10 U
12EX02	1701N12EX02	N	1/26/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	4.38	0.10 U
14BW01	1701N14BW01	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	59.5	0.10 U
14BW02	1701N14BW02	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	18.1	0.10 U
14BW03	1701N14BW03	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	9.99	0.10 U
14EX03	1701N14EX03	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.40	0.10 U	38.0	0.10 U

			Chemical Name	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	CIS-1,2-DCE	TRANS-1,2-DCE	TCE	VC
			Analysis Method	EPA Method 524.3							
			CAS RN	71-55-6	75-34-3	75-35-4	107-06-2	156-59-2	156-60-5	79-01-6	75-01-4
			Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Well ID	Sample Name	Sample Type	Sample Date								
14EX04	1701N14EX04	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	17.7	0.10 U
14EX05	1701N14EX05	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.16 J	0.10 U	4.35	0.10 U
16BW01	1705N16BW0101	N	6/6/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	3.11	0.10 U
16BW01	1705N16BW0102	N	6/6/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	4.31	0.10 U
16BW01	1705N16BW0103	N	6/6/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	7.15	0.10 U
16BW02	1705D16BW0216	FD	6/6/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 J	0.10 U
16BW02	1705N16BW0207	N	6/6/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.20	0.10 U
16BW02	1705N16BW0208	N	6/6/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.29	0.10 U
16BW02	1705N16BW0209	N	6/6/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.22	0.10 U
16CW01	1705D16CW0115	FD	6/6/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	3.92	0.10 U
16CW01	1705N16CW0104	N	6/6/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	3.95	0.10 U
16CW01	1705N16CW0105	N	6/6/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	4.00	0.10 U
16CW01	1705N16CW0106	N	6/6/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	2.73	0.10 U
16CW02	1705N16CW0210	N	6/6/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.71	0.10 U	2.26	0.10 U
16CW02	1705N16CW0211	N	6/6/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.95	0.10 U	1.95	0.10 U
16CW02	1705N16CW0212	N	6/6/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.68	0.10 U	1.71	0.10 U
16CW03	1705N16CW0313	N	6/6/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.28	0.10 U
16CW03	1705N16CW0314	N	6/6/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.26	0.10 U
91AW07	1701N91AW07	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
91AW09	1701N91AW09	N	1/26/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
91AW14	1705N91AW14	N	6/7/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.76	0.10 U
91AW15	1701N91AW15	N	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
91AW17	1705N91AW17	N	6/7/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.14 J	0.10 U
91BW02	1705N91BW02	N	6/7/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
91BW03	1701N91BW03	N	1/26/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	31.1	0.10 U
91BW04	1705N91BW04	N	6/7/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.12 J	0.10 U
92BW01	1701N92BW01	N	1/26/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	23.0	0.10 U
92BW02	1701N92BW02	N	1/26/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.82	0.10 U	7.18	0.10 U
99AW01	1701N99AW01	N	1/26/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.13 J	0.10 U
99AW08	1701D99AW08	FD	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U

			Chemical Name	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	CIS-1,2-DCE	TRANS-1,2-DCE	TCE	VC
			Analysis Method	EPA Method 524.3							
			CAS RN	71-55-6	75-34-3	75-35-4	107-06-2	156-59-2	156-60-5	79-01-6	75-01-4
			Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Well ID	Sample Name	Sample Type	Sample Date								
99AW08	1701N99AW08	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
99AW09	1701N99AW09	N	1/27/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	2.28	0.10 U
99BW01	1701N99BW01	N	1/26/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	29.8	0.10 U
99BW09	1701N99BW09	N	1/27/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
99BW10	1701N99BW10	N	1/27/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	11.2	0.10 U
99BW11	1701N99BW11	N	1/28/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 J	0.10 U
99BW12	1701B99BW12	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.43	0.10 U
99BW14	1701N99BW14	N	1/27/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
99BW15	1701N99BW15	N	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	1.50	0.10 U	7.06	0.10 U
99BW16	1701N99BW16	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.49	0.10 U
99BW18	1701N99BW18	N	1/27/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	7.09	0.10 U
Private Wells											
WP-03	1701NWP03	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.21	0.10 U	1.08	0.10 U
WP-03	1708NWP03	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.30	0.10 U	1.22	0.10 U
WP-04	1701NWP04	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	1.98	0.10 U	5.65	0.10 U
WP-09	1708NWP09	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-10	1708NWP10	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.08 J	0.10 U
WP-105	1708NWP105	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.45	0.10 U
WP-111	1708NWP111	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.26	0.10 U
WP-116	1701DWP116	FD	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.44	0.10 U	1.68	0.10 U
WP-116	1701NWP116	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.42	0.10 U	1.54	0.10 U
WP-118	1708NWP118	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.16	0.10 U
WP-120	1708NWP120	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.35	0.10 U
WP-122	1708DWP122	FD	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.63	0.10 U
WP-122	1708NWP122	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.61	0.10 U
WP-126	1708NWP126	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.07	0.10 U
WP-128	1708NWP128	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.49	0.10 U
WP-130	1708NWP130	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-131	1708DWP131	FD	8/23/2017	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	1.52 J-	0.10 UJ
WP-131	1708NWP131	N	8/23/2017	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	1.54 J-	0.10 UJ

			Chemical Name	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	CIS-1,2-DCE	TRANS-1,2-DCE	TCE	VC
			Analysis Method	EPA Method 524.3							
			CAS RN	71-55-6	75-34-3	75-35-4	107-06-2	156-59-2	156-60-5	79-01-6	75-01-4
			Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Well ID	Sample Name	Sample Type	Sample Date								
WP-136	1708DWP136	FD	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.23	0.10 U
WP-136	1701NWP136	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.27	0.10 U
WP-136	1708NWP136	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.15	0.10 U
WP-137	1701NWP137	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 J	0.10 U	0.50	0.10 U
WP-137	1708NWP137	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.21	0.10 U
WP-138	1708NWP138	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.64	0.10 U
WP-139	1708NWP139	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.79	0.10 U
WP-144	1708NWP144	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.33	0.10 U
WP-145	1708NWP145	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.26	0.10 U
WP-147	1708NWP147	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.19 J	0.10 U
WP-148	1708NWP148	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.18 J	0.10 U
WP-149	1708NWP149	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 J	0.10 U
WP-150	1708DWP150	FD	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-150	1708NWP150	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 J	0.10 U
WP-152	1708NWP152	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.28	0.10 U
WP-153	1708NWP153	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.38	0.10 U
WP-154	1708NWP154	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.37	0.10 U
WP-155	1708NWP155	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.24	0.10 U
WP-156	1708NWP156	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.45	0.10 U
WP-165	1708NWP165	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-167	1708NWP167	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	2.54	0.10 U
WP-168	1708NWP168	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	2.40	0.10 U
WP-169	1701NWP169	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.93	0.10 U
WP-169	1708NWP169	N	8/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.00	0.10 U
WP-170	1708NWP170	N	8/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.25	0.10 U
WP-171	1708DWP171	FD	8/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-171	1708NWP171	N	8/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-172	1708NWP172	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.83	0.10 U
WP-173	1708NWP173	N	8/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-175	1708NWP175	N	8/22/2017	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.12 J	0.10 UJ

			Chemical Name	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	CIS-1,2-DCE	TRANS-1,2-DCE	TCE	VC
			Analysis Method	EPA Method 524.3							
			CAS RN	71-55-6	75-34-3	75-35-4	107-06-2	156-59-2	156-60-5	79-01-6	75-01-4
			Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Well ID	Sample Name	Sample Type	Sample Date								
WP-176	1701NWP176	N	1/27/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.34	0.10 U
WP-176	1708NWP176	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.38	0.10 U
WP-177	1708NWP177	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-178	1708NWP178	N	8/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.34	0.10 U
WP-179	1708NWP179	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-181	1708DWP181	FD	8/23/2017	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.12 J	0.10 UJ
WP-181	1708NWP181	N	8/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.14 J	0.10 U
WP-182	1708NWP182	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.32	0.10 U
WP-183	1708NWP183	N	8/23/2017	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ
WP-25W	1708NWP25W	N	8/23/2017	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.64 J-	0.10 UJ
WP-28	1701DWP28	FD	1/26/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.09 J	0.10 U
WP-28	1701NWP28	N	1/26/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.09 J	0.10 U
WP-45	1708NWP45	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.92	0.10 U
WP-50	1708NWP50	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-52	1708NWP52	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 J	0.10 U
WP-54	1708DWP54	FD	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-54	1708NWP54	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.07 J	0.10 U
WP-57	1708NWP57	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.49	0.10 U
WP-65	1708NWP65	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.60	0.10 U
WP-66	1701NWP66	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.39	0.10 U	1.72	0.10 U
WP-66	1708NWP66	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.40	0.10 U	1.89	0.10 U
WP-68	1708NWP68	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.12 J	0.10 U	0.73	0.10 U
WP-69	1708DWP69	FD	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.15 J	0.10 U	1.72	0.10 U
WP-69	1701NWP69	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.58	0.10 U
WP-69	1708NWP69	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.58	0.10 U
WP-71A	1708NWP71A	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.18 J	0.10 U
WP-71B	1708NWP71B	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.35	0.10 U
WP-74	1701NWP74	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.26	0.10 U
WP-74	1708NWP74	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.30	0.10 U
WP-82	1708NWP82	N	8/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 J	0.10 U

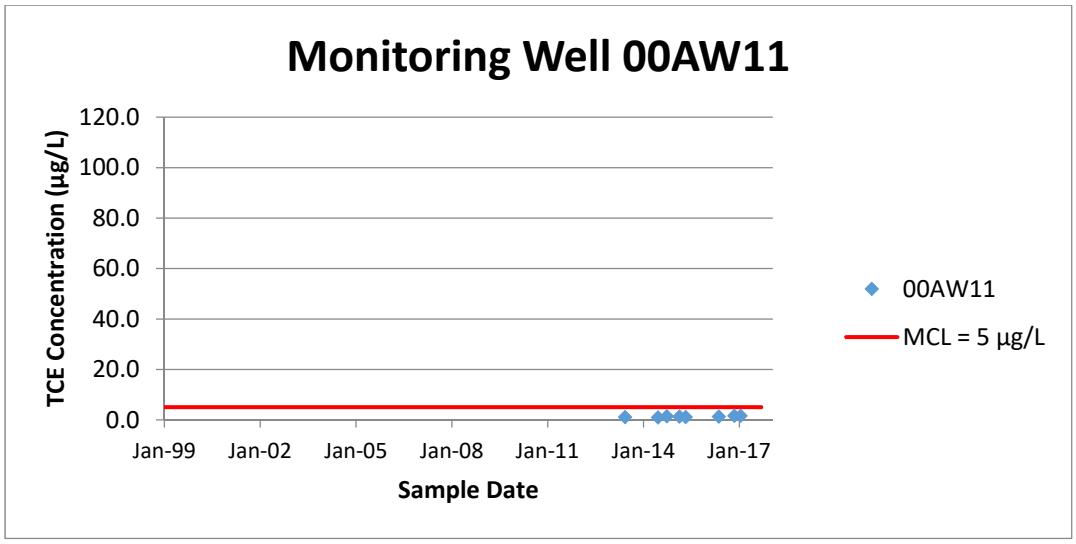
			Chemical Name	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	CIS-1,2-DCE	TRANS-1,2-DCE	TCE	VC
			Analysis Method	EPA Method 524.3							
			CAS RN	71-55-6	75-34-3	75-35-4	107-06-2	156-59-2	156-60-5	79-01-6	75-01-4
			Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Well ID	Sample Name	Sample Type	Sample Date								
Private Wells with Whole House Filters											
WP-119 Influent	1708NWP119A1	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.24	0.10 U	3.52	0.10 U
WP-119 Mid	1708NWP119B1	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-119 Effluent	1708NWP119C1	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-121 Influent	1708DWP121A1	FD	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.20	0.10 U	3.91	0.10 U
WP-121 Influent	1708NWP121A1	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.20	0.10 U	4.36	0.10 U
WP-121 Mid	1708NWP121B1	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-121 Effluent	1708NWP121C1	N	8/21/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-123 Influent	1708NWP123A1	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.26	0.10 U	2.50	0.10 U
WP-123 Mid	1708NWP123B1	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-123 Effluent	1708NWP123C1	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-124 Influent	1701DWP124A1	FD	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	1.35	0.10 U	5.51	0.10 U
WP-124 Influent	1701NWP124A1	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	1.55	0.10 U	5.68 J-	0.10 U
WP-124 Mid	1701NWP124B1	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-124 Effluent	1701NWP124C1	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-125 Influent	1701NWP125A1	N	1/26/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.94	0.10 U	3.61	0.10 U
WP-125 Mid	1701NWP125B1	N	1/26/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-125 Effluent	1701NWP125C1	N	1/26/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-129 Influent	1701DWP129A1	FD	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	3.05	0.10 U
WP-129 Influent	1701NWP129A1	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.11 J	0.10 U	3.57	0.10 U
WP-129 Mid	1701NWP129B1	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-129 Effluent	1701NWP129C1	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-14 Influent	1708NWP14A1	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.82	0.10 U	2.53	0.10 U
WP-14 Mid	1708NWP14B1	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	1.02	0.10 U	0.39	0.10 U
WP-14 Effluent	1708NWP14C1	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-70 Mid	1708DWP70B1	FD	8/23/2017	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ
WP-70 Influent	1708NWP70A1	N	8/23/2017	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.34 J-	0.10 UJ	3.41 J-	0.10 UJ
WP-70 Mid	1708NWP70B1	N	8/23/2017	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ
WP-70 Effluent	1708NWP70C1	N	8/23/2017	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ
WP-83 Influent	1708NWP83A1	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.23	0.10 U	1.66	0.10 U

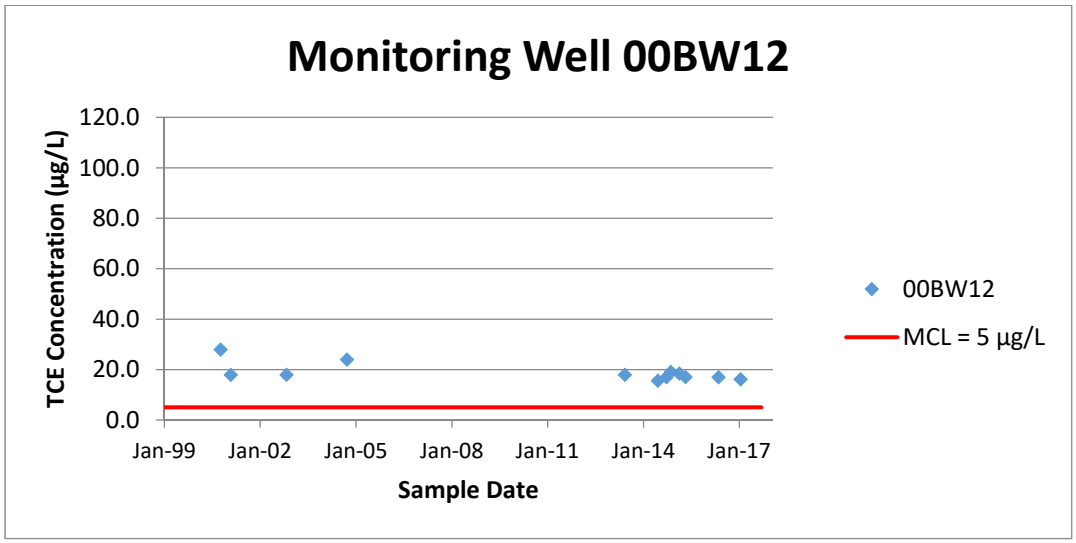
			Chemical Name	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	CIS-1,2-DCE	TRANS-1,2-DCE	TCE	VC
			Analysis Method	EPA Method 524.3							
			CAS RN	71-55-6	75-34-3	75-35-4	107-06-2	156-59-2	156-60-5	79-01-6	75-01-4
			Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Well ID	Sample Name	Sample Type	Sample Date								
WP-83 Mid	1708NWP83B1	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-83 Effluent	1708NWP83C1	N	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-86 Influent	1701NWP86A1	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	2.53	0.10 U
WP-86 Mid	1701NWP86B1	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
WP-86 Effluent	1701NWP86C1	N	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Quality Control Samples											
Collected at 91BW02	1705FB91BW02	FB	6/7/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
	1708EB01	EB	8/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
	1701TB01	TB	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
	1701TB02	TB	1/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
	1701TB03	TB	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.09 J	0.10 U
	1701TB04	TB	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
	1701TB05	TB	1/25/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
	1701TB06	TB	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
	1701TB07	TB	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
	1701TB08	TB	1/24/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
	1705TB01	TB	6/6/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
	1705TB02	TB	6/7/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
	1705TB03	TB	6/7/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
	1708TB05	TB	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
	1708TB01	TB	8/22/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
	1708TB02	TB	8/23/2017	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
	1708TB03	TB	8/23/2017	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ

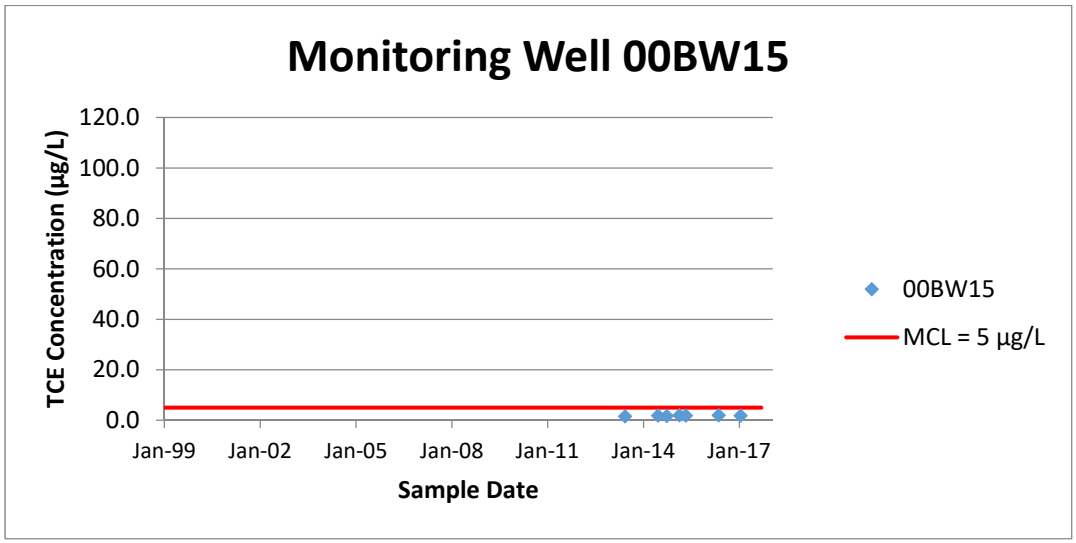
1,1,1-TCA	1,1,1-TRICHLOROETHANE
1,1-DCA	1,1-DICHLOROETHANE
1,1-DCE	1,1-DICHLOROETHENE
1,2-DCA	1,2-DICHLOROETHANE
CIS-1,2-DCE	CIS-1,2-DICHLOROETHENE
TRANS-1,2-DCE	TRANS-1,2-DICHLOROETHENE
TCE	TRICHLOROETHENE
VC	VINYL CHLORIDE

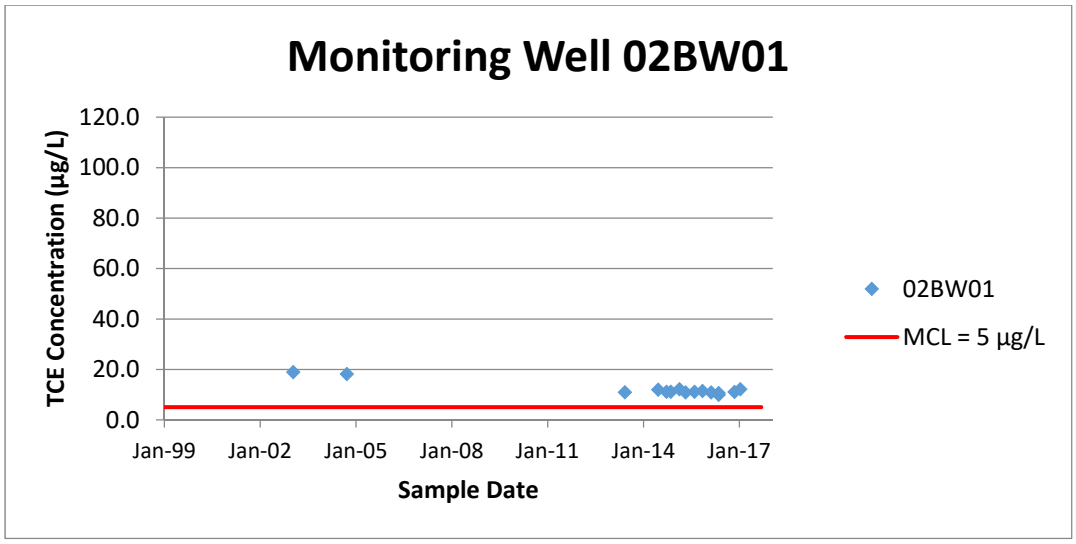
FD	Field Duplicate
EB	Equipment Blank
N	Normal Sample
TB	Trip Blank
FB	Field Blank

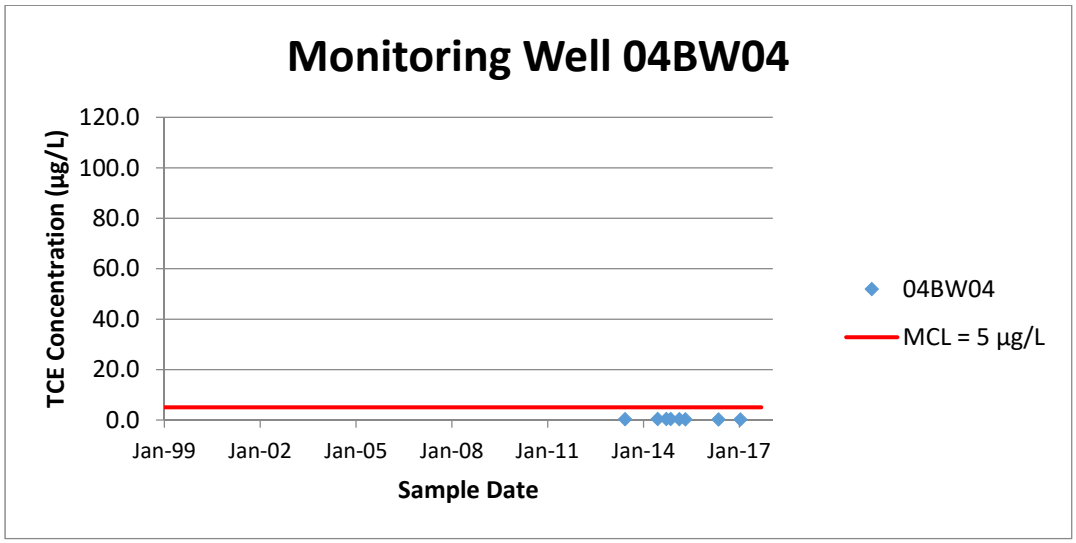
APPENDIX C – TCE Time-Series Graphs

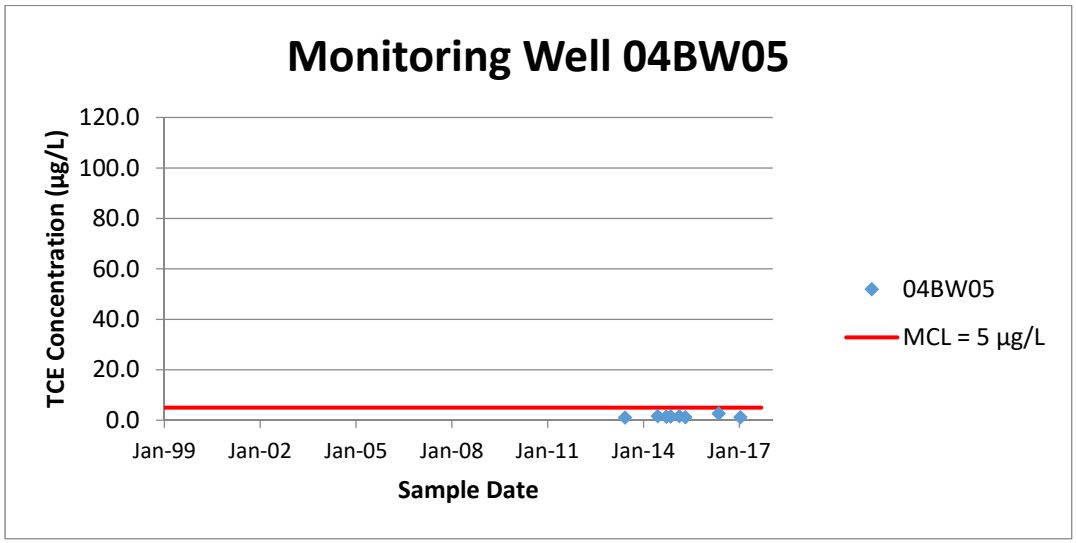

Monitoring Well 00AW11
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
00AW11
MCL = 5 µg/L

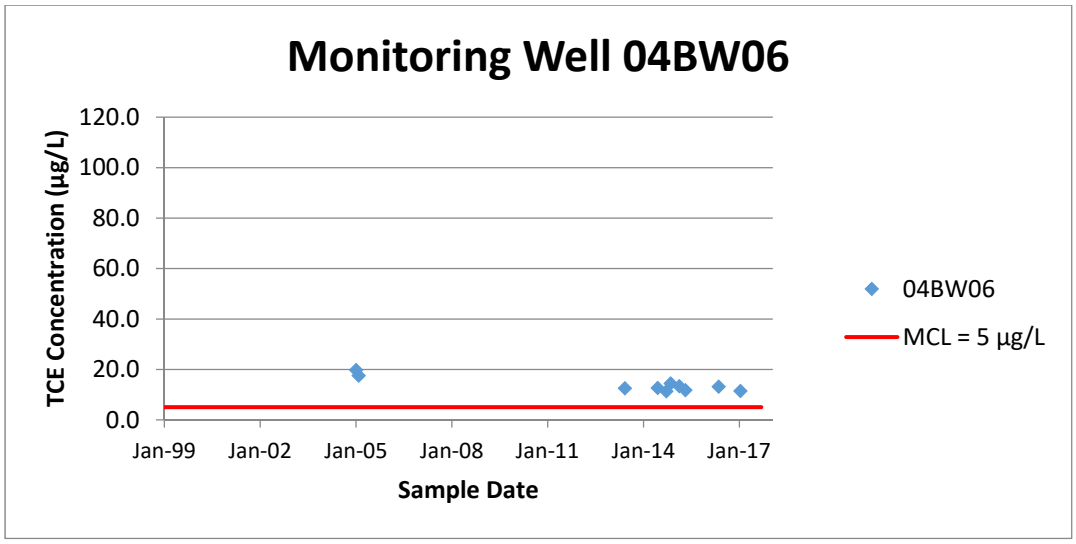

Monitoring Well 00BW12
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
00BW12
MCL = 5 µg/L

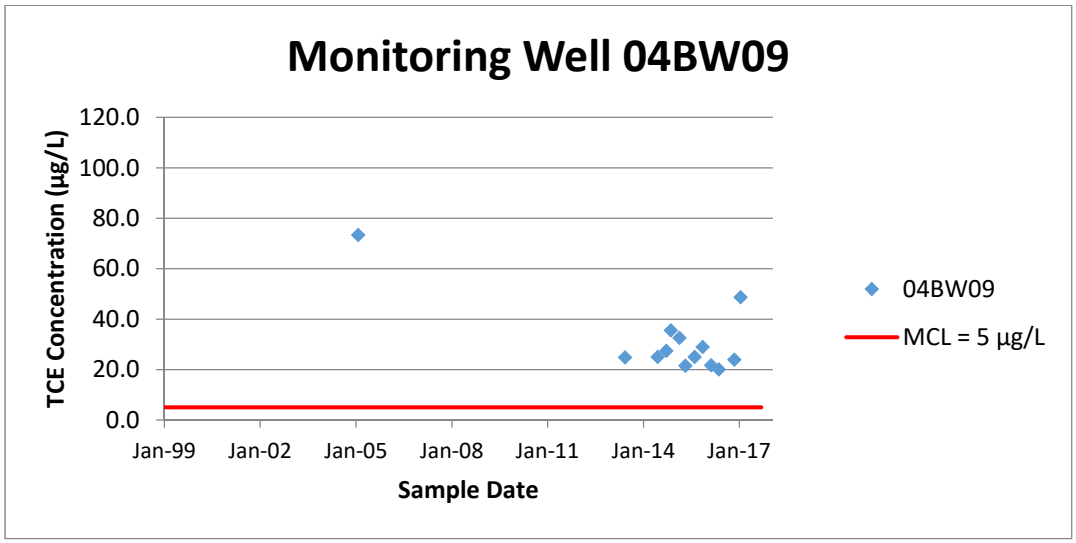

Monitoring Well 00BW15
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
00BW15
MCL = 5 µg/L

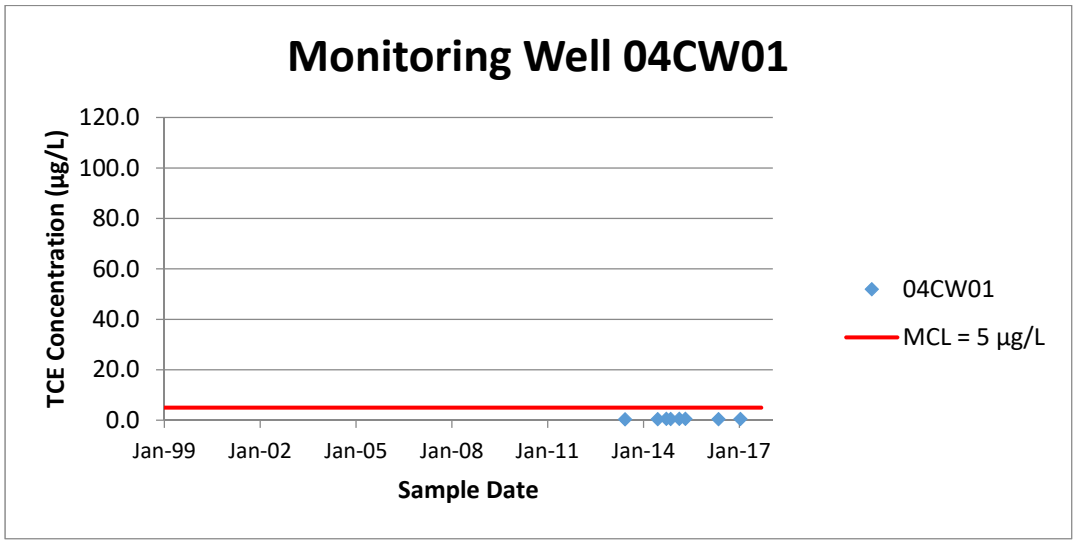

Monitoring Well 02BW01
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
02BW01
MCL = 5 µg/L

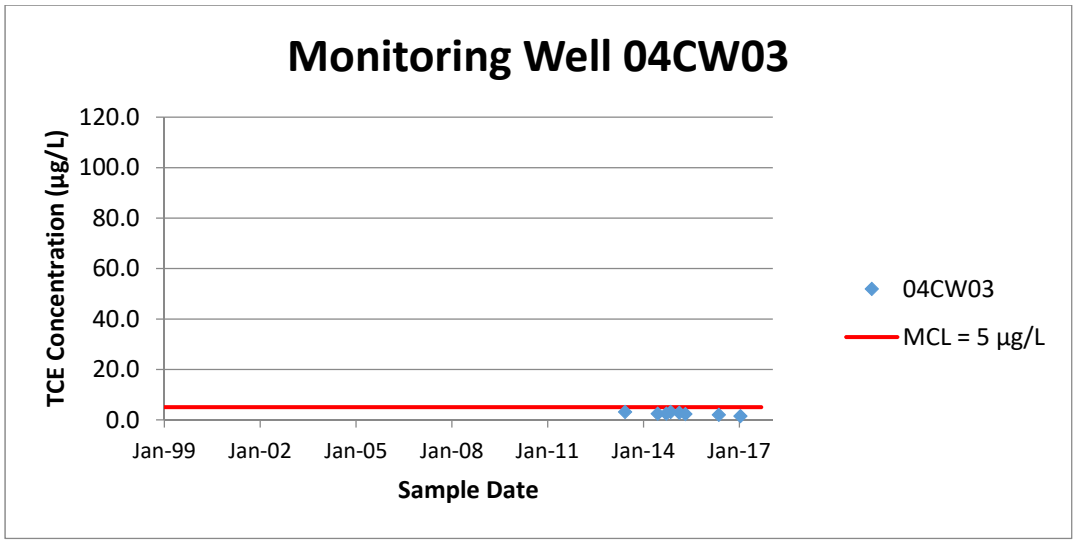

Monitoring Well 04BW04
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
04BW04
MCL = 5 µg/L

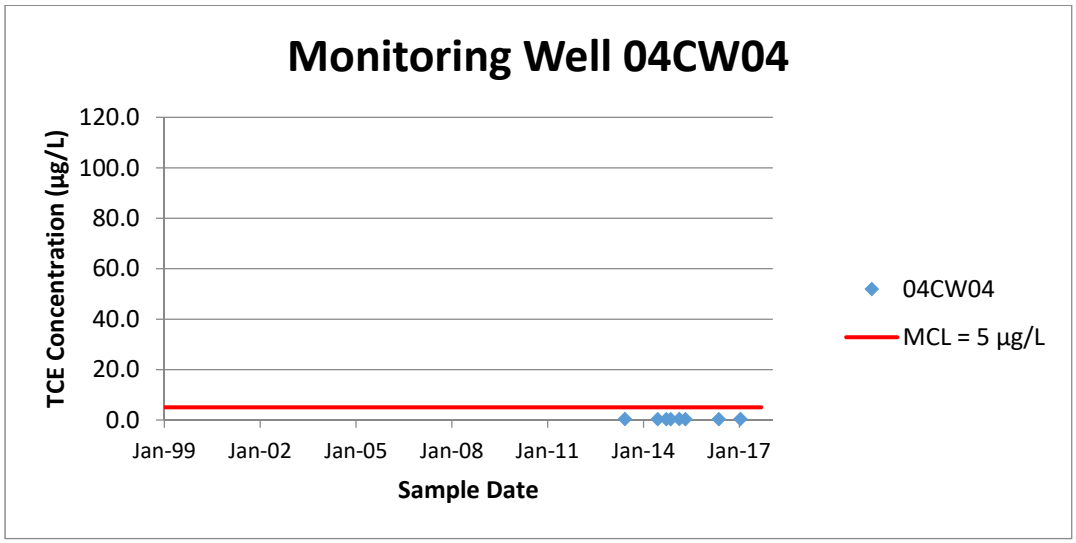

Monitoring Well 04BW05
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
04BW05
MCL = 5 µg/L

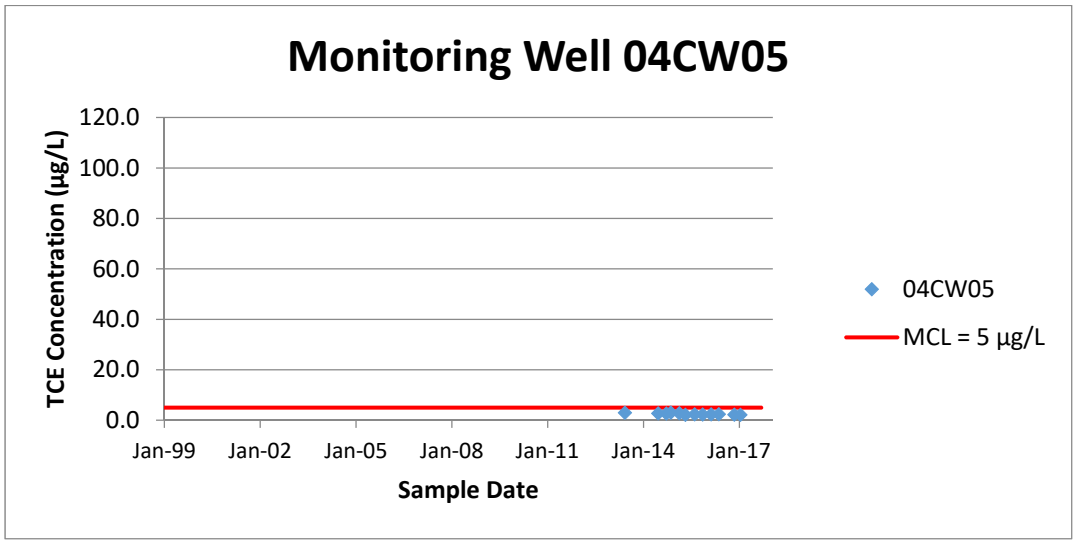

Monitoring Well 04BW06
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
04BW06
MCL = 5 µg/L

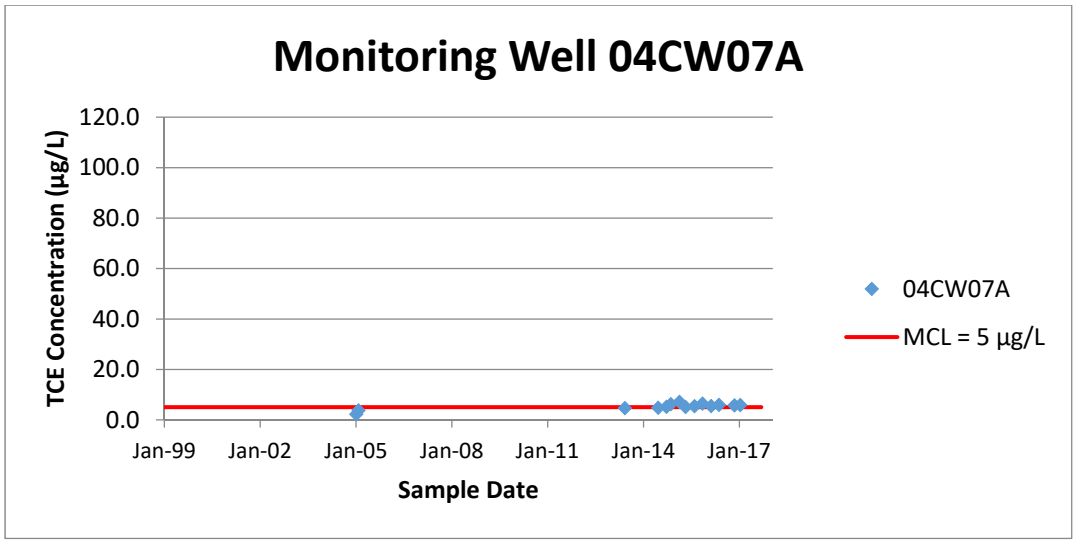

Monitoring Well 04BW09
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
04BW09
MCL = 5 µg/L

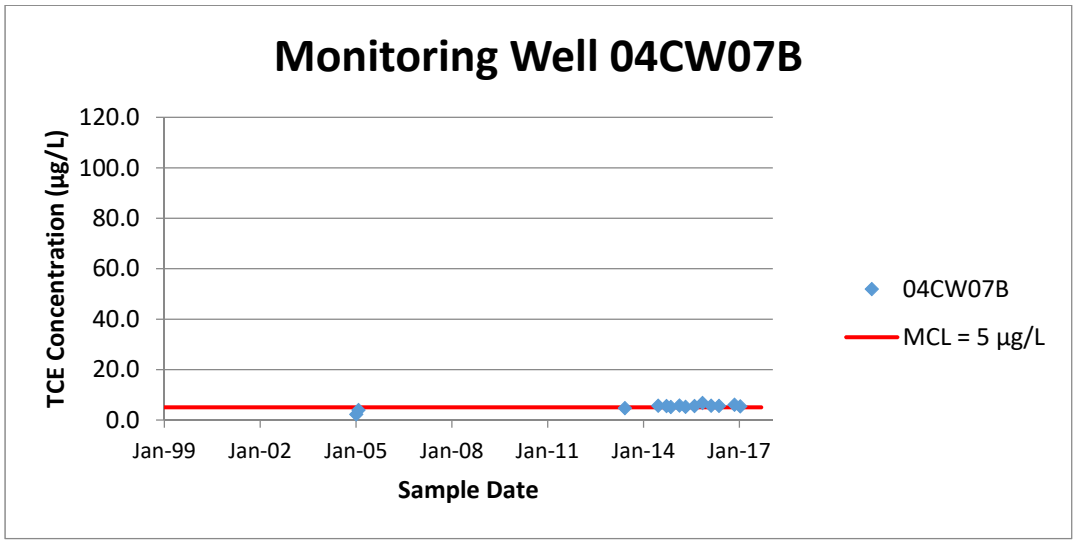

Monitoring Well 04CW01
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
04CW01
MCL = 5 µg/L

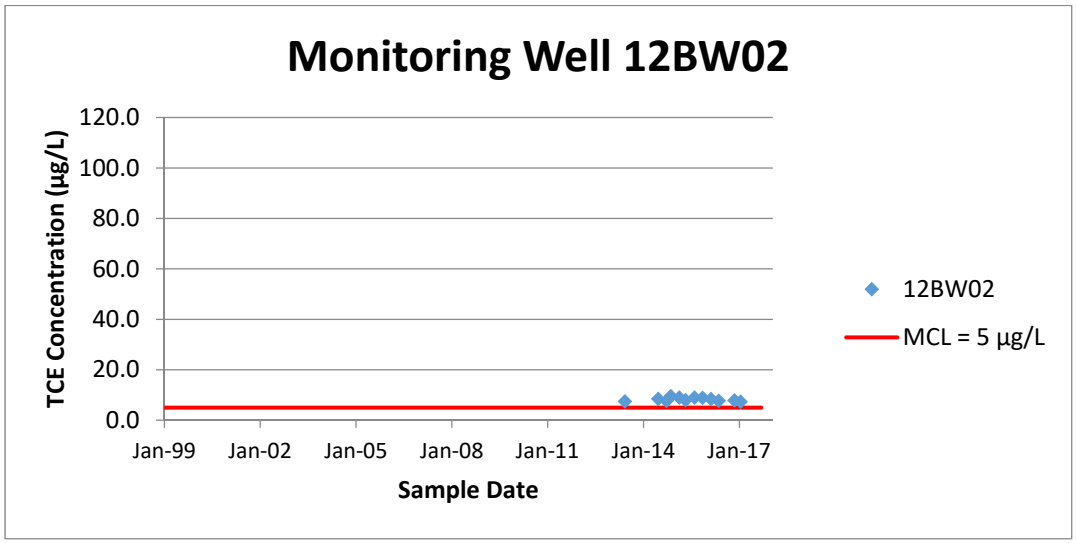

Monitoring Well 04CW03
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
04CW03
MCL = 5 µg/L

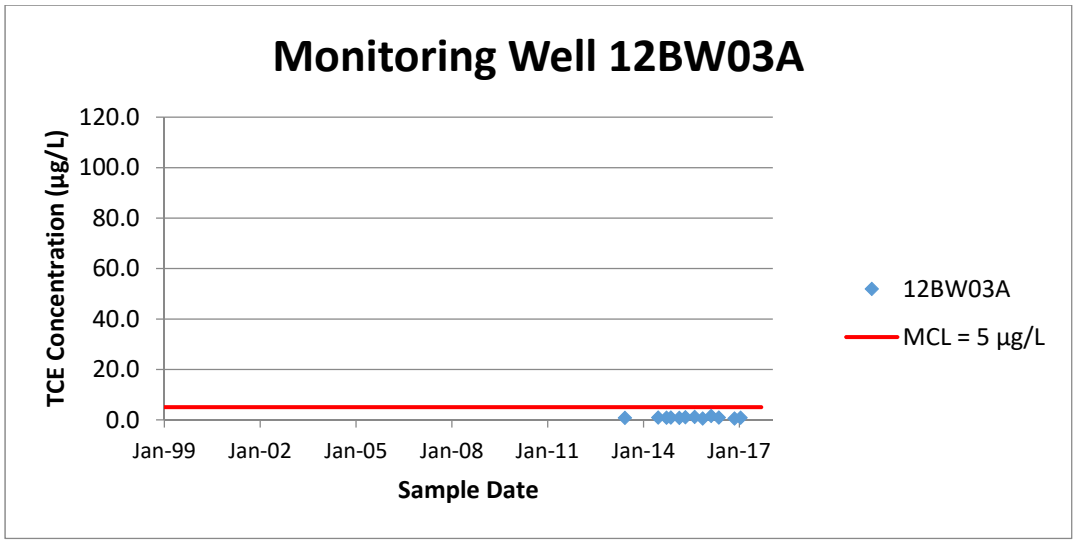

Monitoring Well 04CW04
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
04CW04
MCL = 5 µg/L

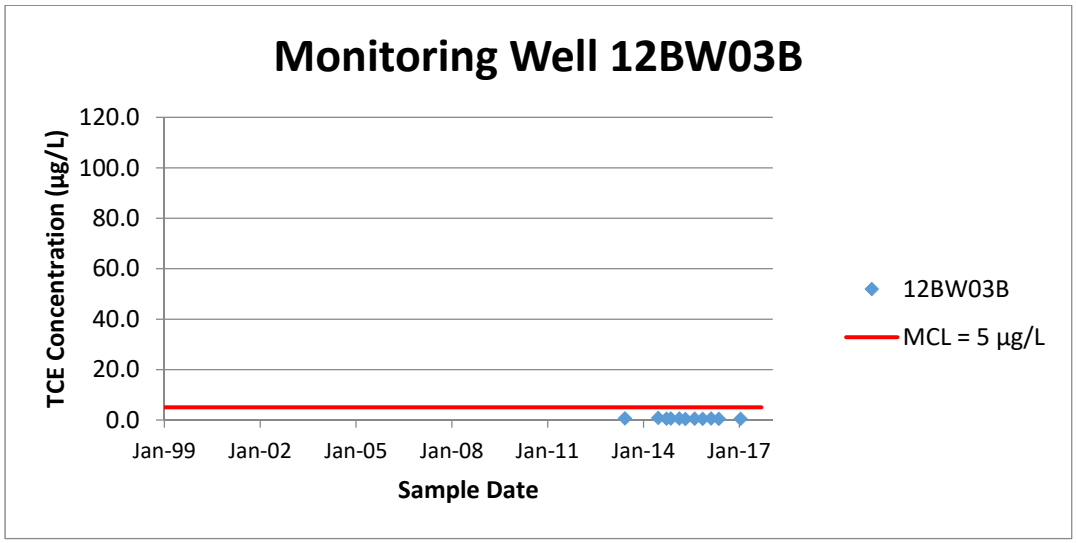

Monitoring Well 04CW05
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
04CW05
MCL = 5 µg/L

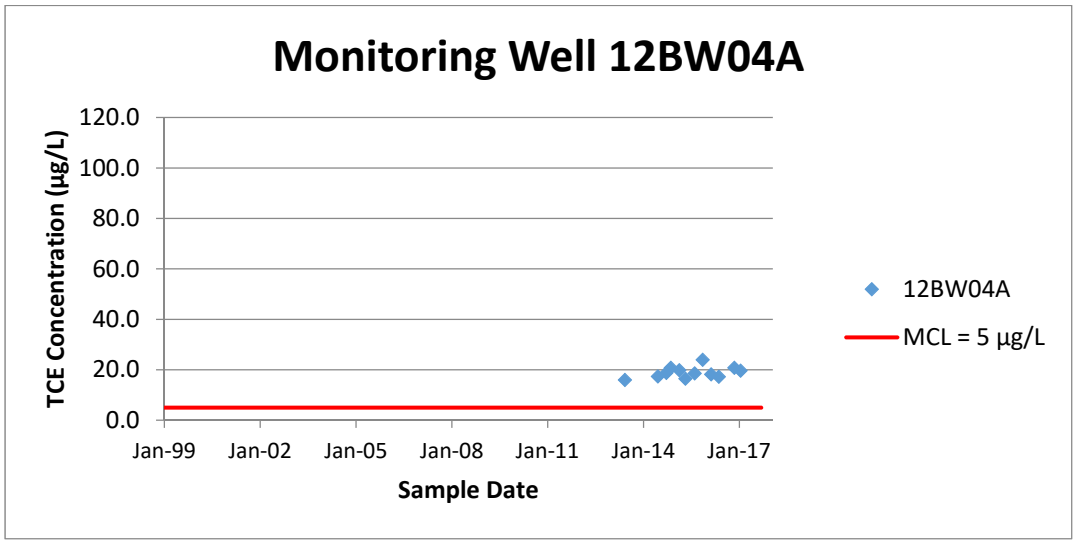

Monitoring Well 04CW07A
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
04CW07A
MCL = 5 µg/L

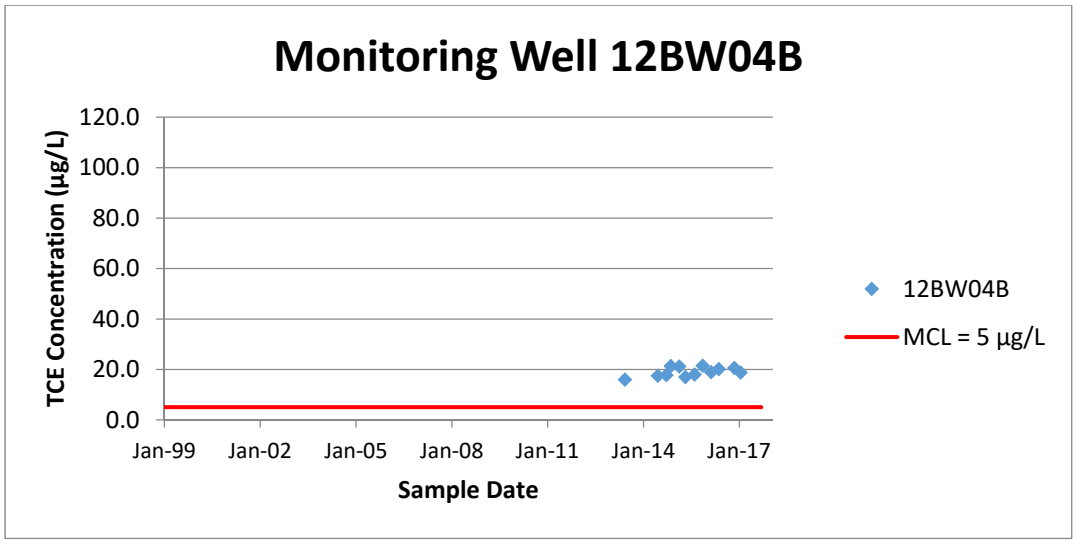

Monitoring Well 04CW07B
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
04CW07B
MCL = 5 µg/L

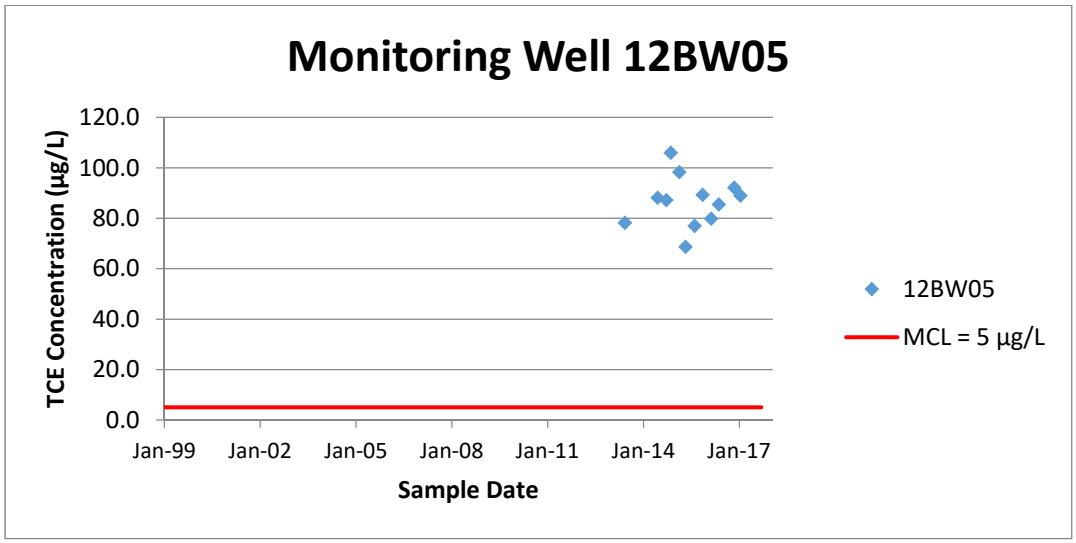

Monitoring Well 12BW02
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
12BW02
MCL = 5 µg/L

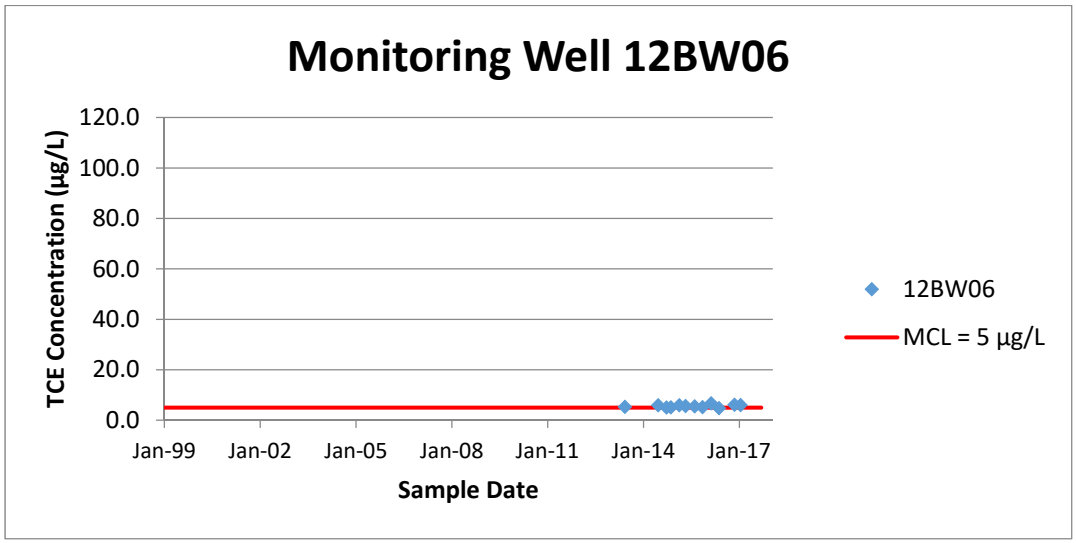

Monitoring Well 12BW03A
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
12BW03A
MCL = 5 µg/L

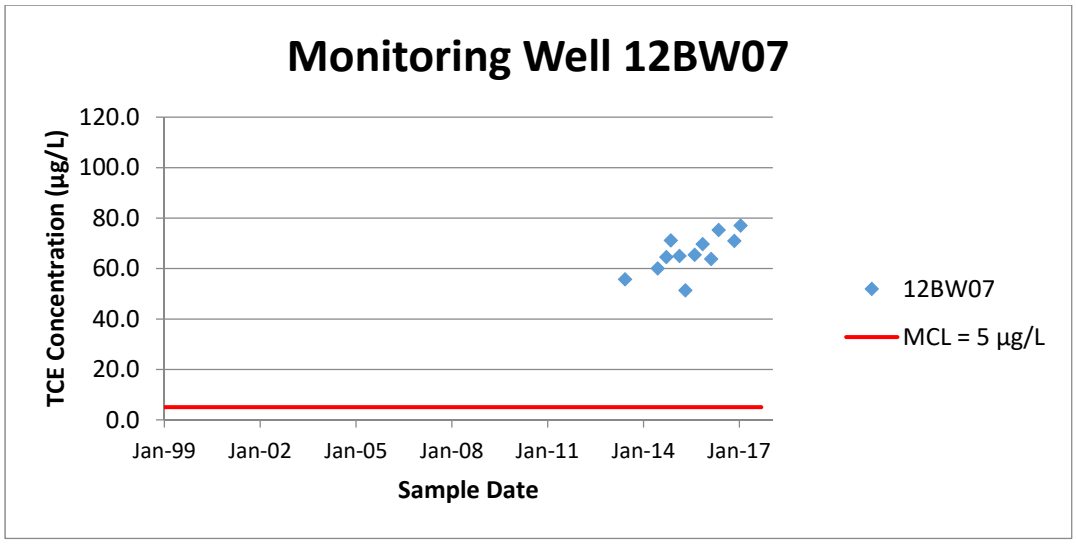

Monitoring Well 12BW03B
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
12BW03B
MCL = 5 µg/L

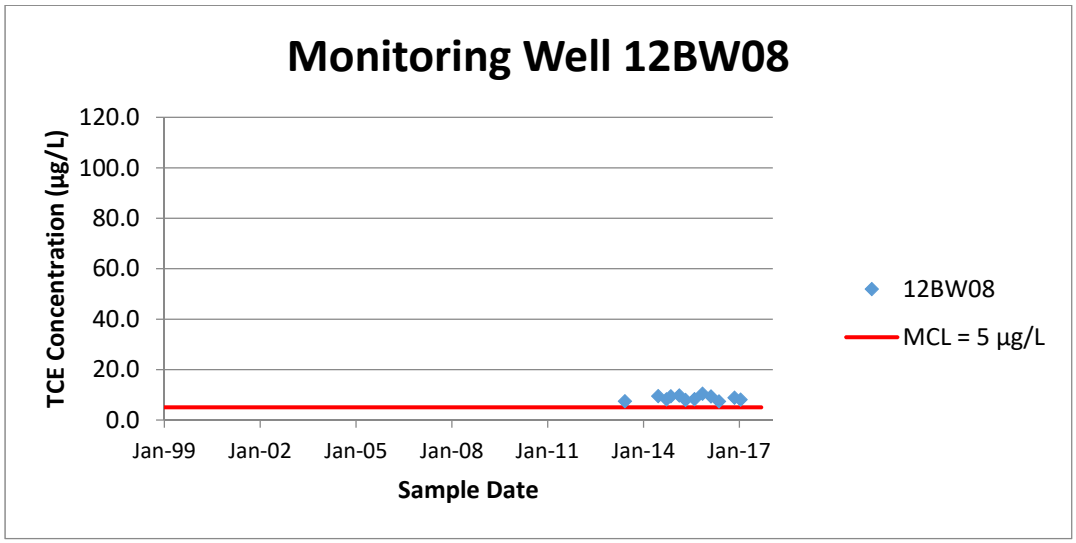

Monitoring Well 12BW04A
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
12BW04A
MCL = 5 µg/L

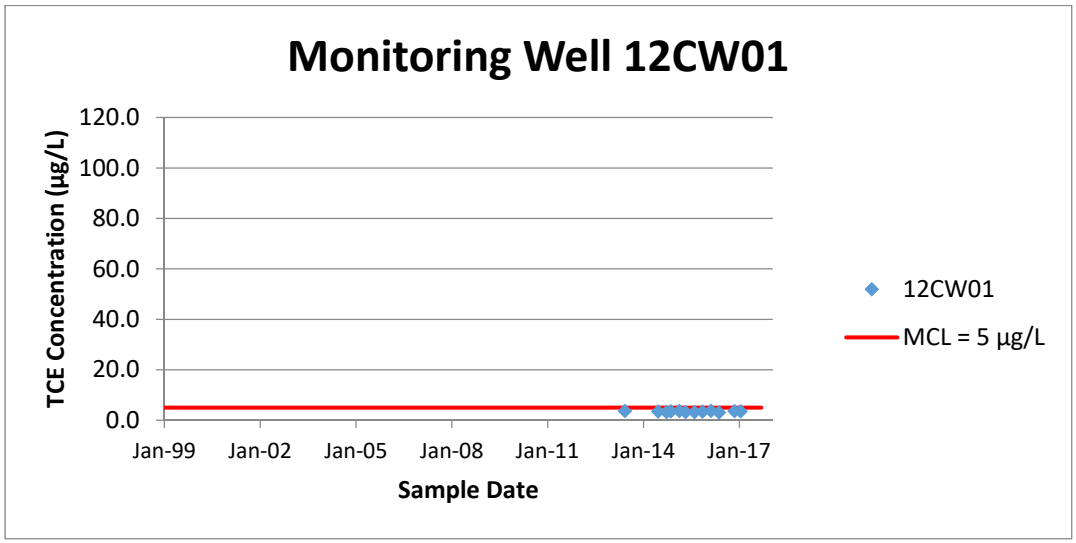

Monitoring Well 12BW04B
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
12BW04B
MCL = 5 µg/L

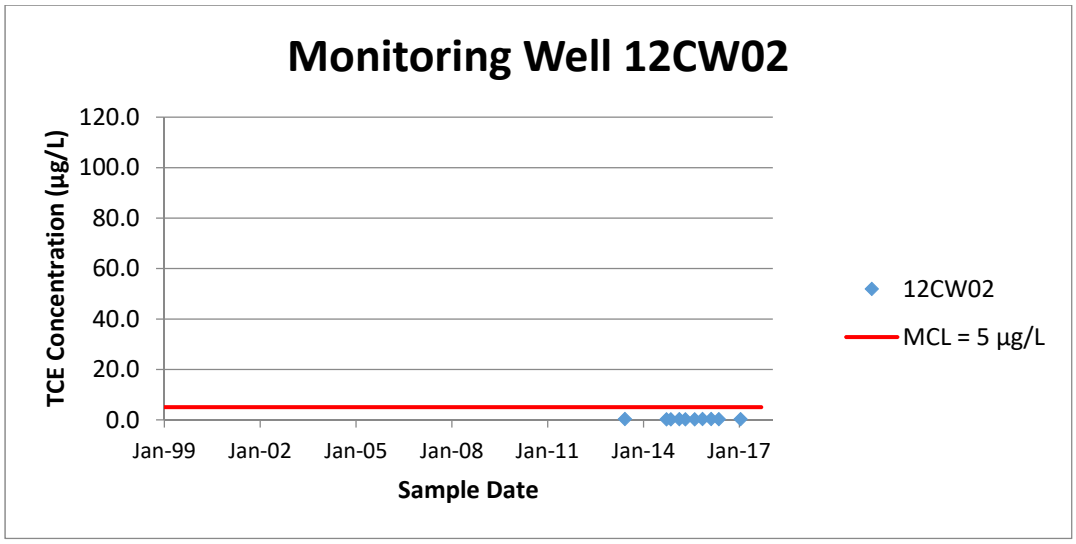

Monitoring Well 12BW05
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
12BW05
MCL = 5 µg/L

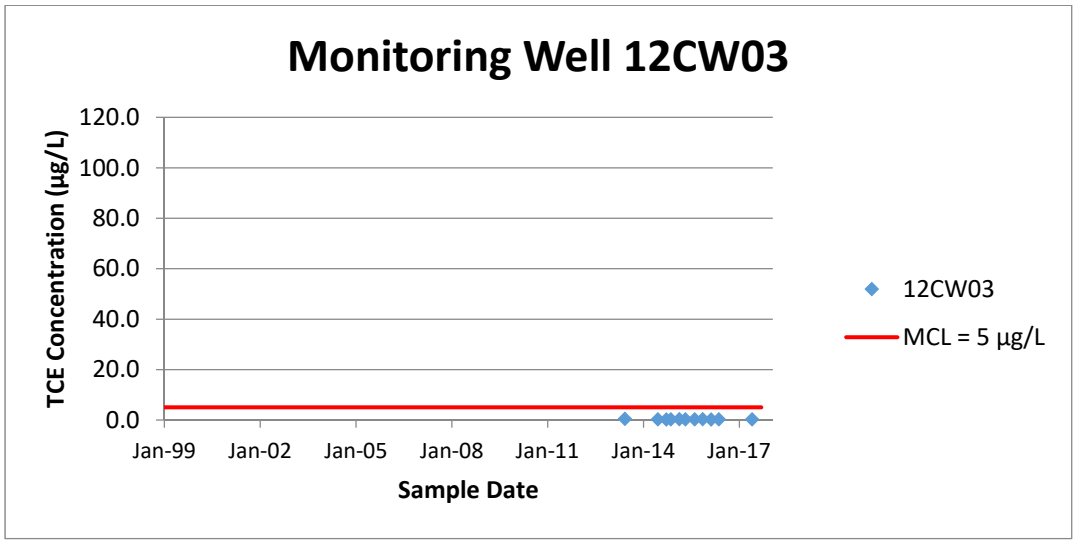

Monitoring Well 12BW06
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
12BW06
MCL = 5 µg/L

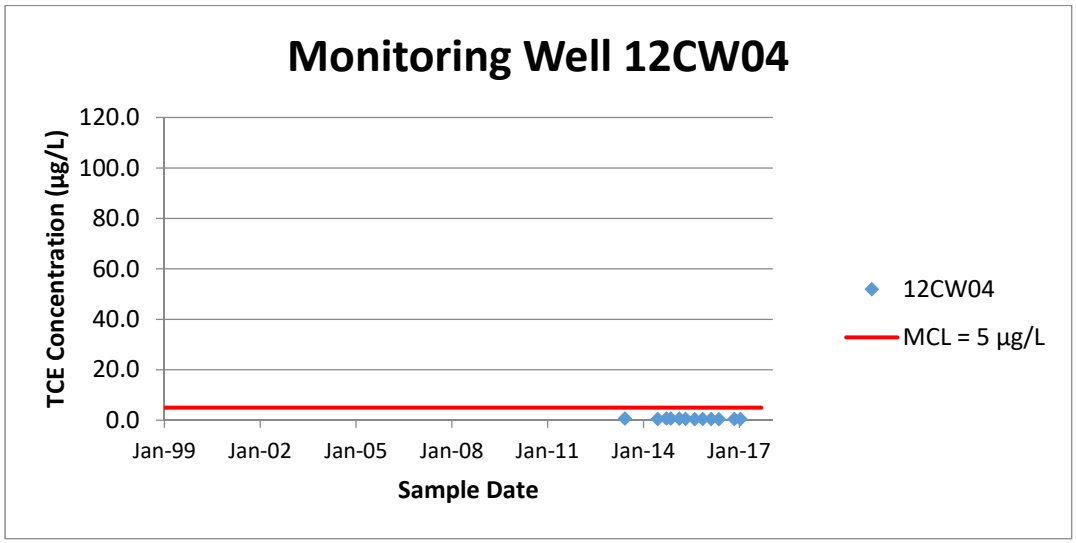

Monitoring Well 12BW07
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
12BW07
MCL = 5 µg/L

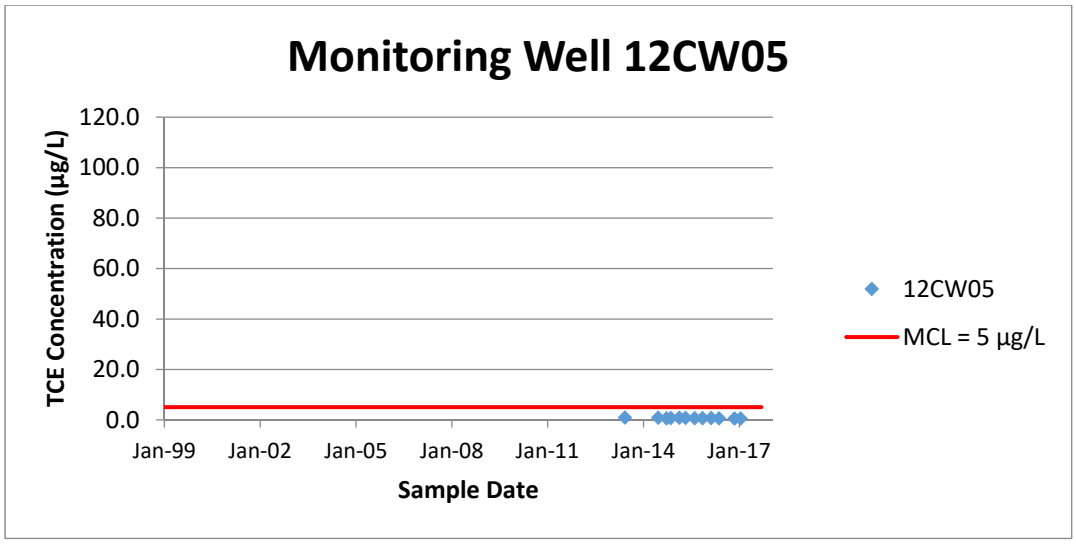

Monitoring Well 12BW08
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
12BW08
MCL = 5 µg/L

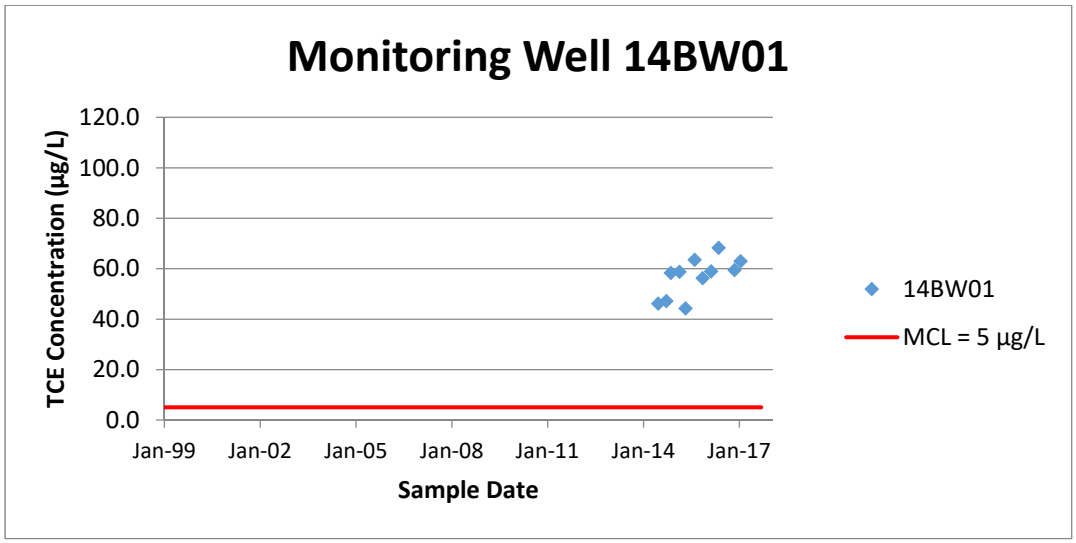

Monitoring Well 12CW01
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
12CW01
MCL = 5 µg/L

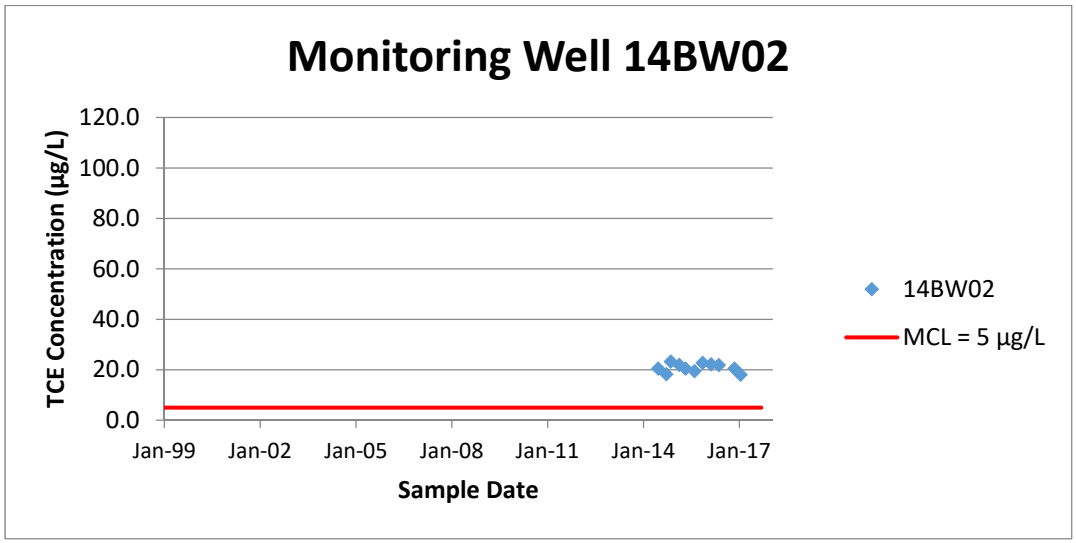

Monitoring Well 12CW02
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
12CW02
MCL = 5 µg/L

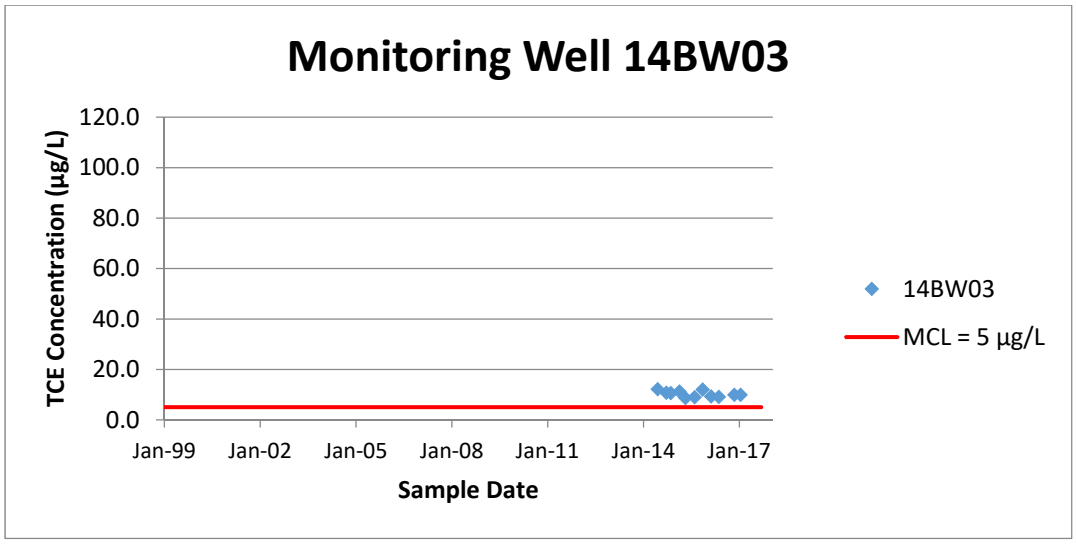

Monitoring Well 12CW03
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
12CW03
MCL = 5 µg/L

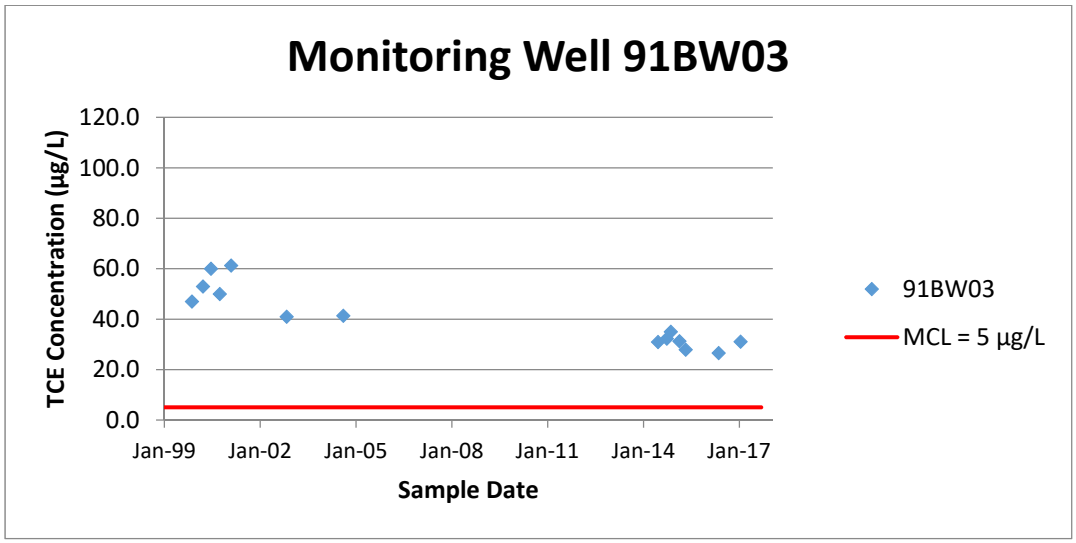

Monitoring Well 12CW04
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
12CW04
MCL = 5 µg/L

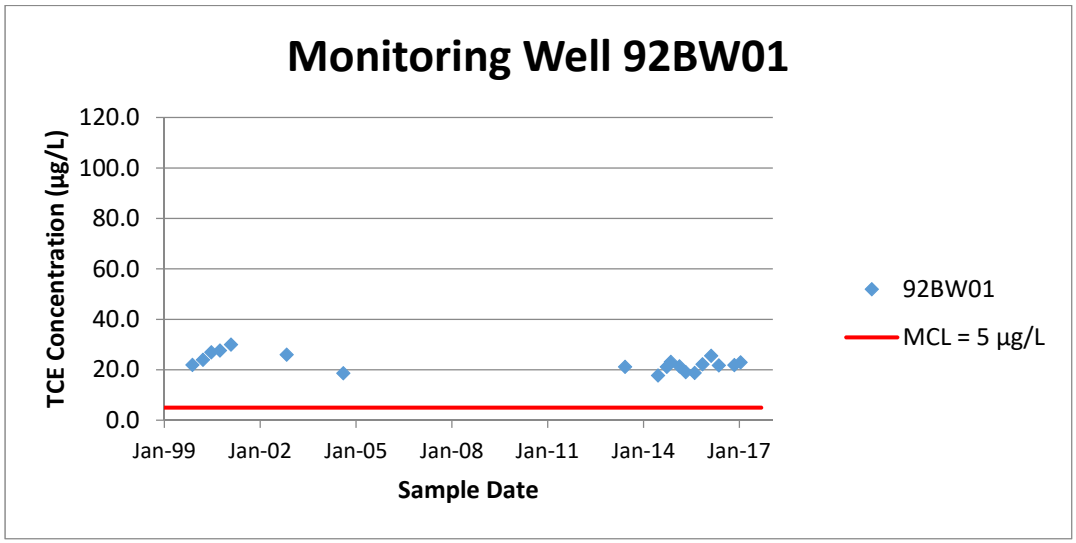

Monitoring Well 12CW05
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
12CW05
MCL = 5 µg/L

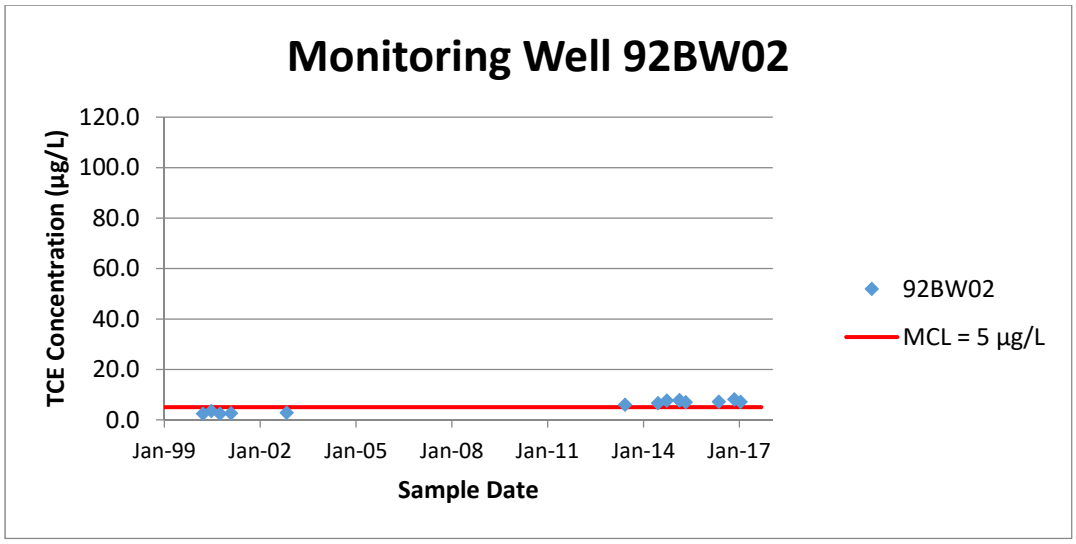

Monitoring Well 14BW01
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
14BW01
MCL = 5 µg/L

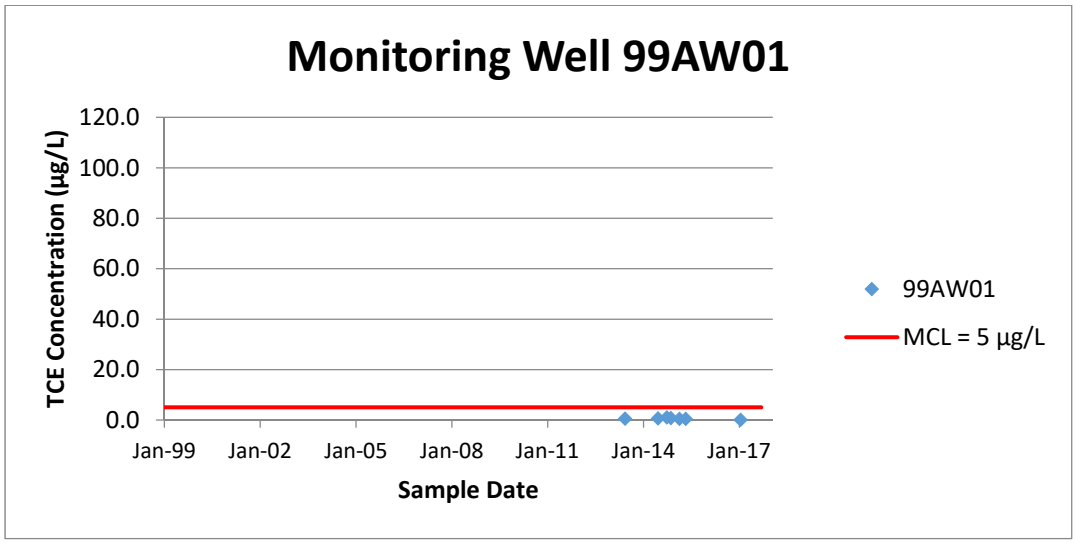

Monitoring Well 14BW02
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
14BW02
MCL = 5 µg/L

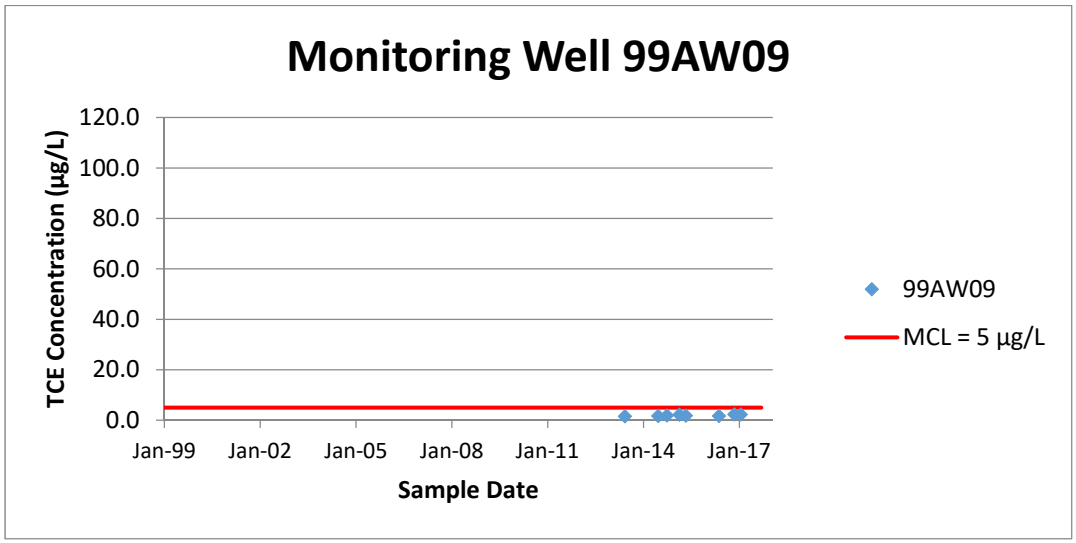

Monitoring Well 14BW03
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
14BW03
MCL = 5 µg/L

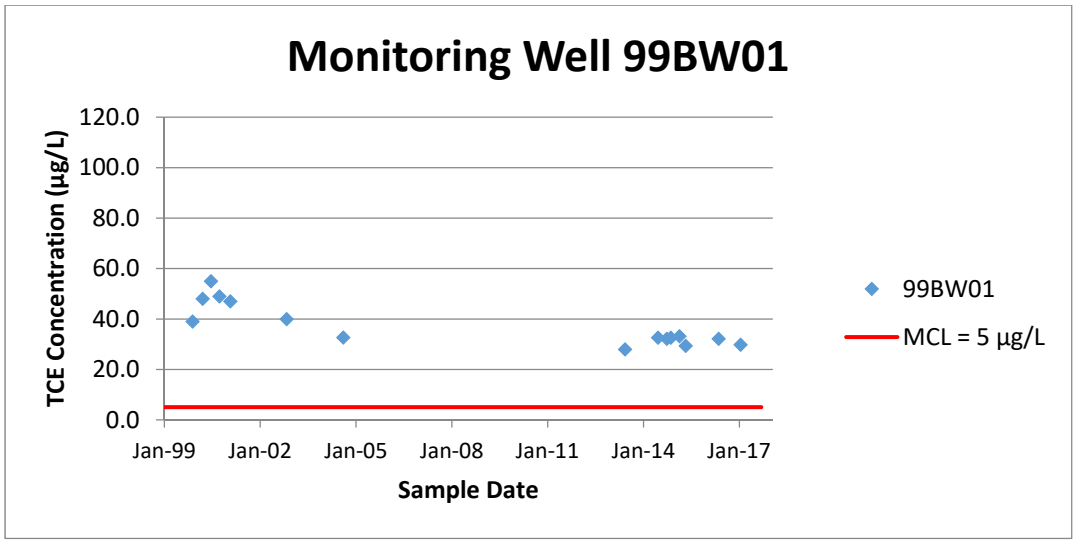

Monitoring Well 91BW03
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
91BW03
MCL = 5 µg/L

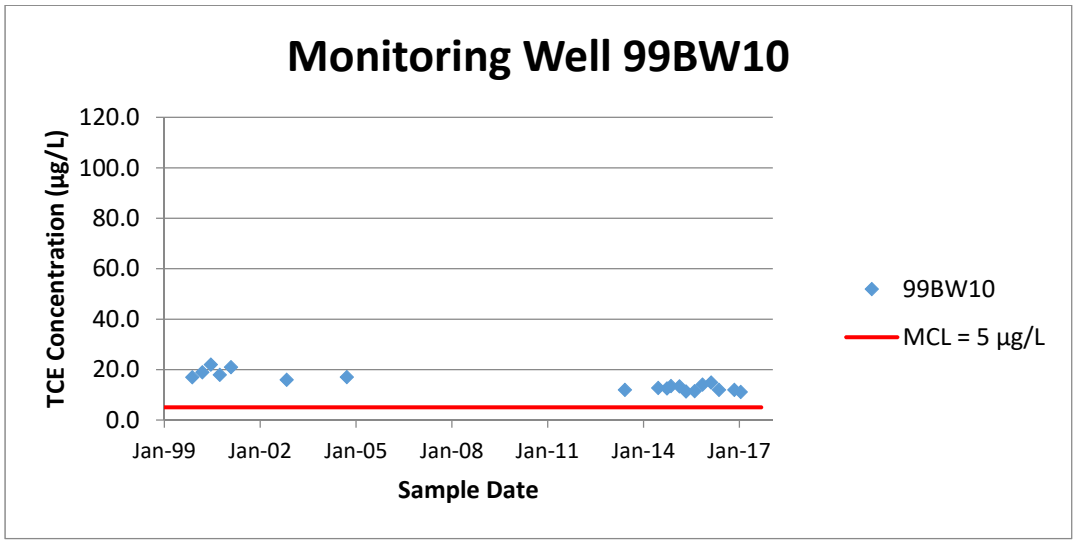

Monitoring Well 92BW01
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
92BW01
MCL = 5 µg/L

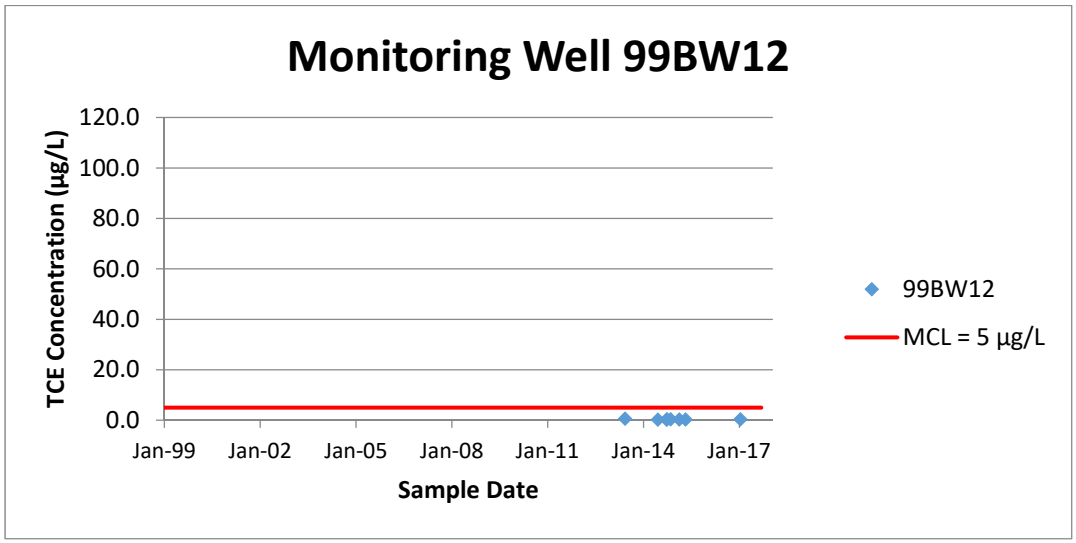

Monitoring Well 92BW02
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
92BW02
MCL = 5 µg/L

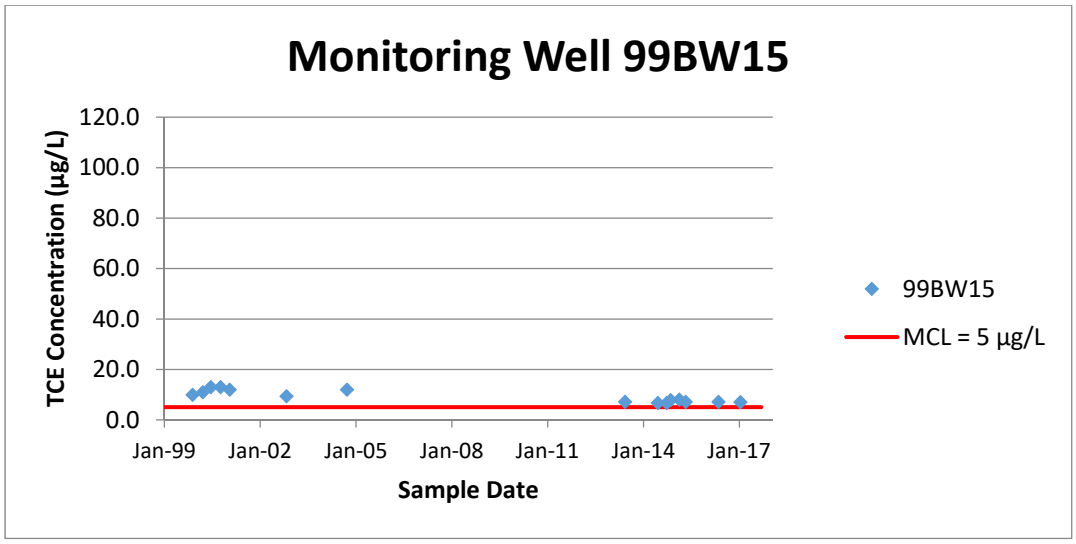

Monitoring Well 99AW01
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
99AW01
MCL = 5 µg/L

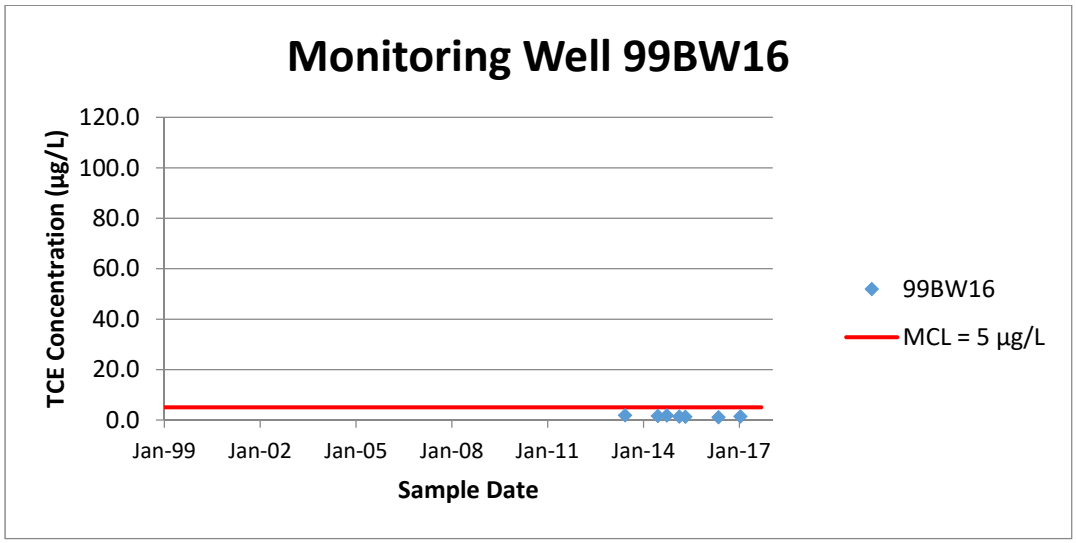

Monitoring Well 99AW09
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
99AW09
MCL = 5 µg/L

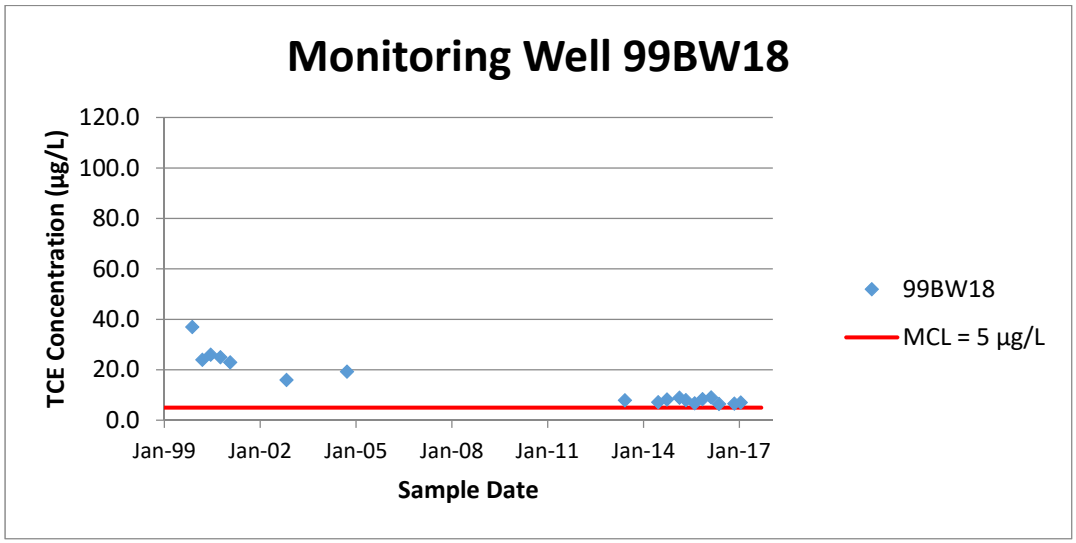

Monitoring Well 99BW01
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
99BW01
MCL = 5 µg/L

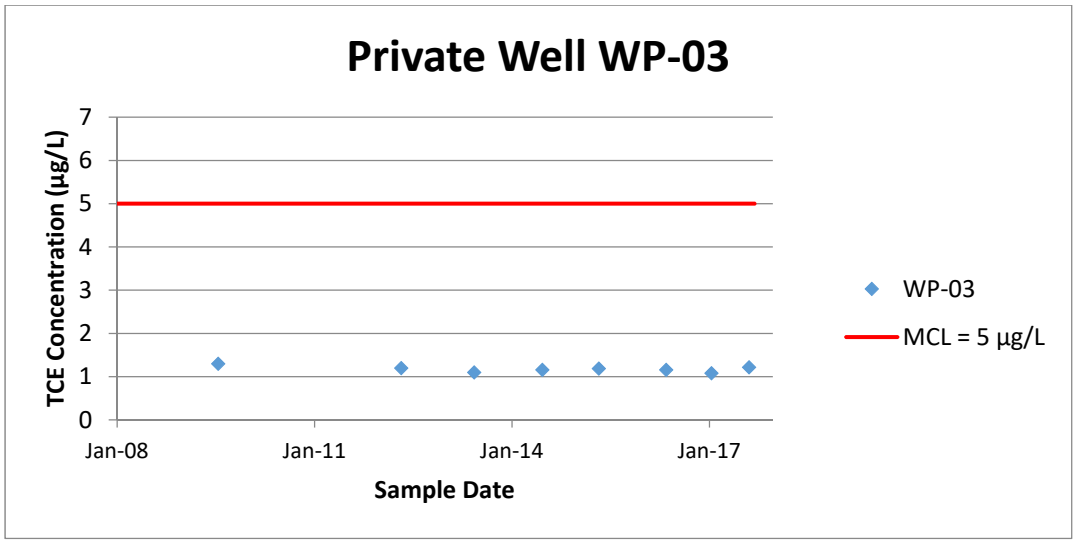

Monitoring Well 99BW10
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
99BW10
MCL = 5 µg/L

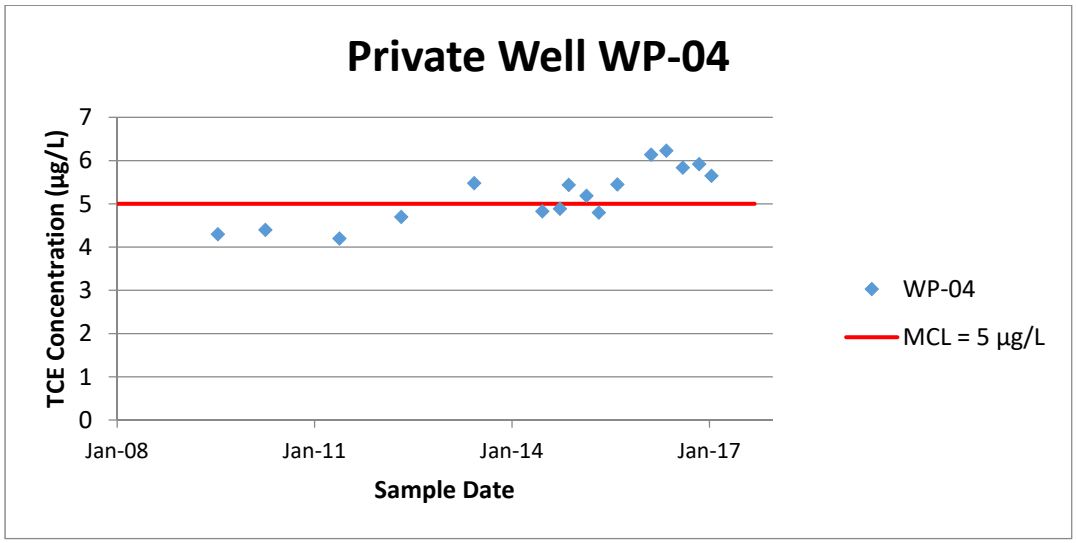

Monitoring Well 99BW12
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
99BW12
MCL = 5 µg/L

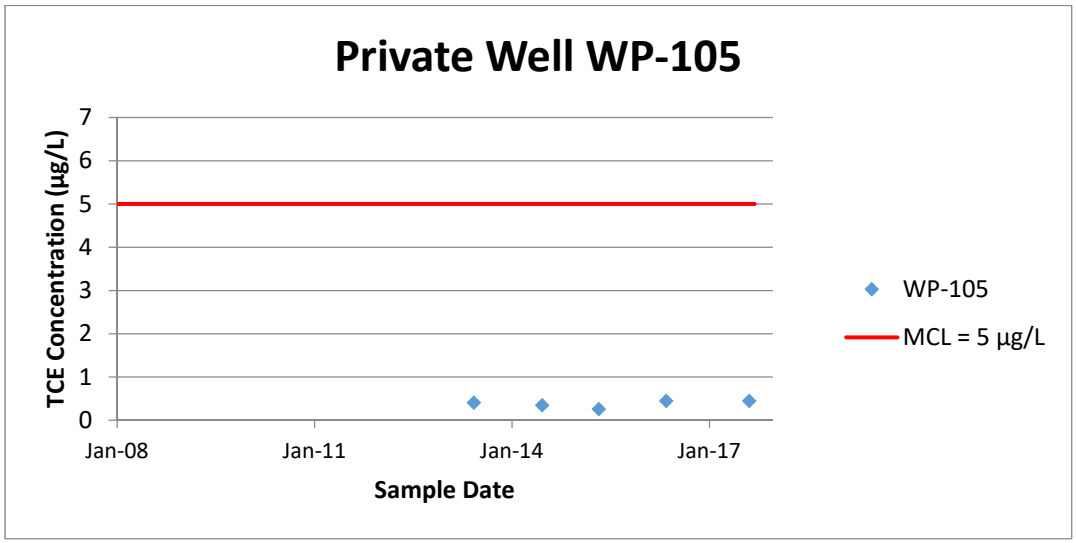

Monitoring Well 99BW15
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
99BW15
MCL = 5 µg/L

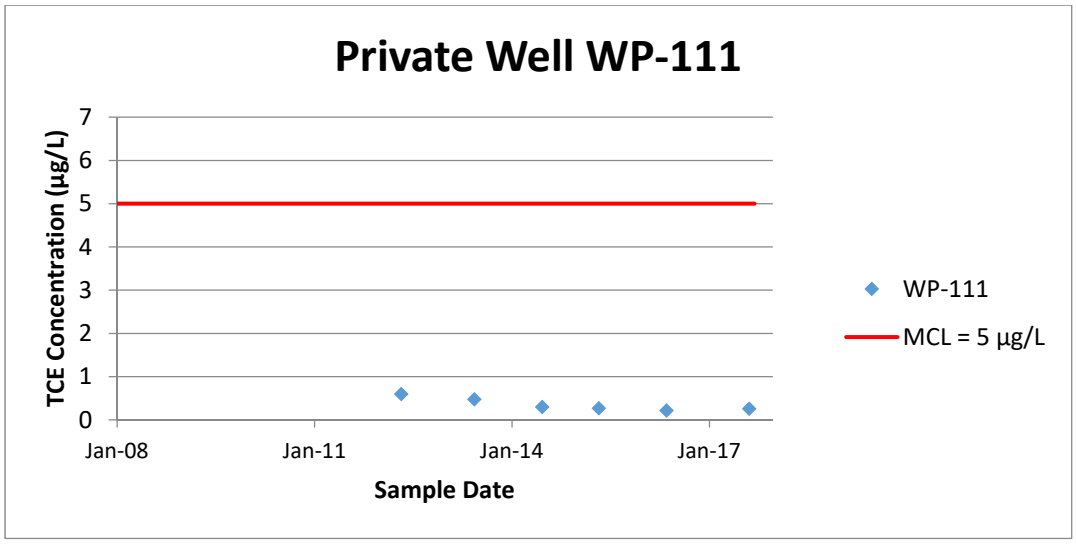

Monitoring Well 99BW16
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
99BW16
MCL = 5 µg/L

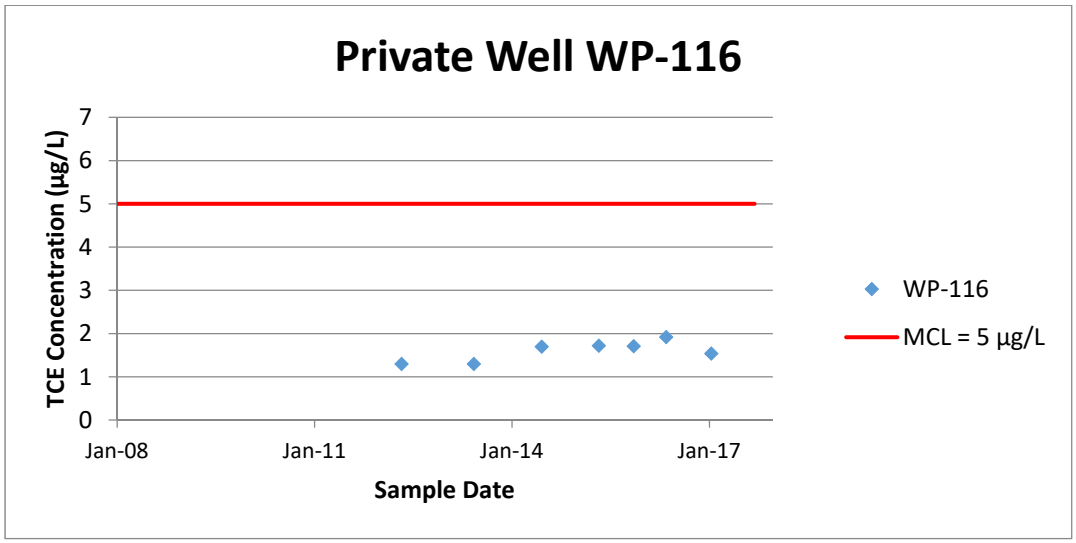

Monitoring Well 99BW18
TCE Concentration (µg/L)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
99BW18
MCL = 5 µg/L

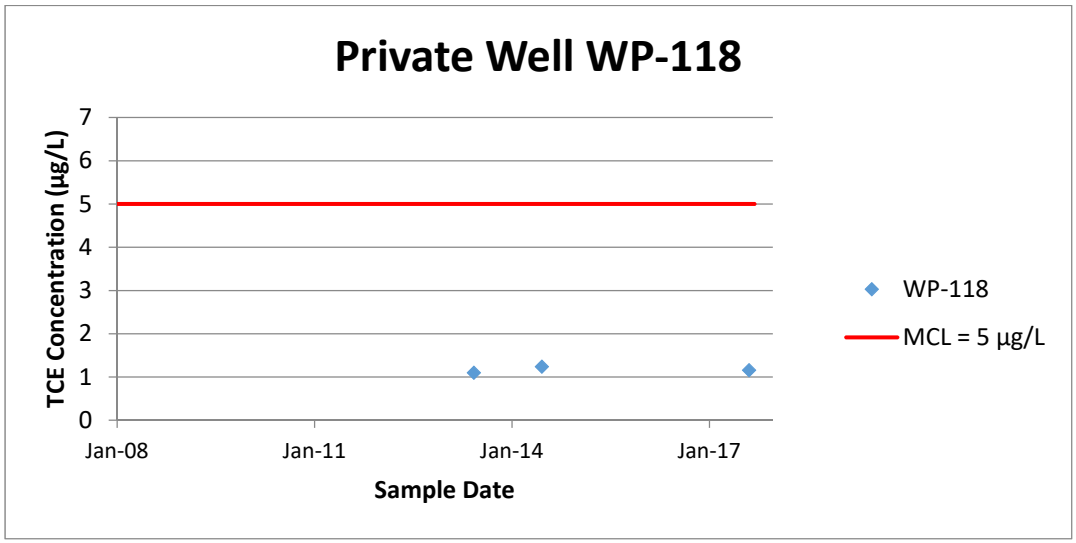

Private Well WP-03
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-03
MCL = 5 µg/L

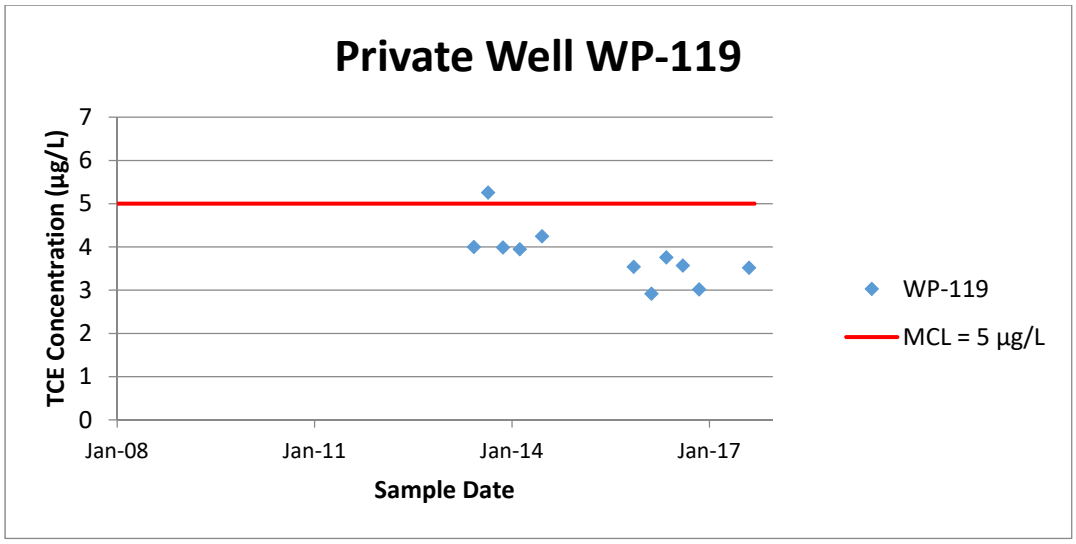

Private Well WP-04
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-04
MCL = 5 µg/L

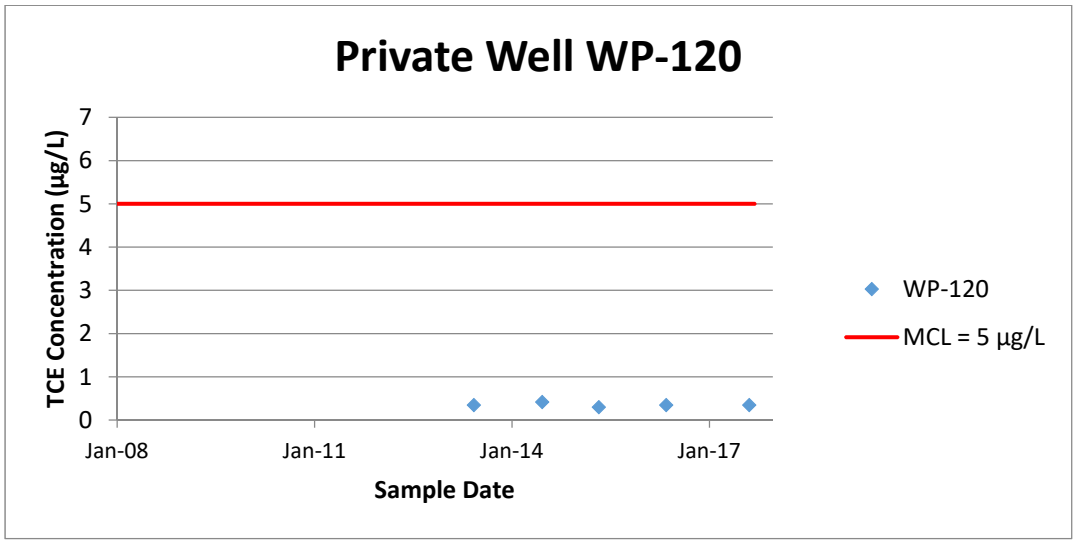

Private Well WP-105
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-105
MCL = 5 µg/L

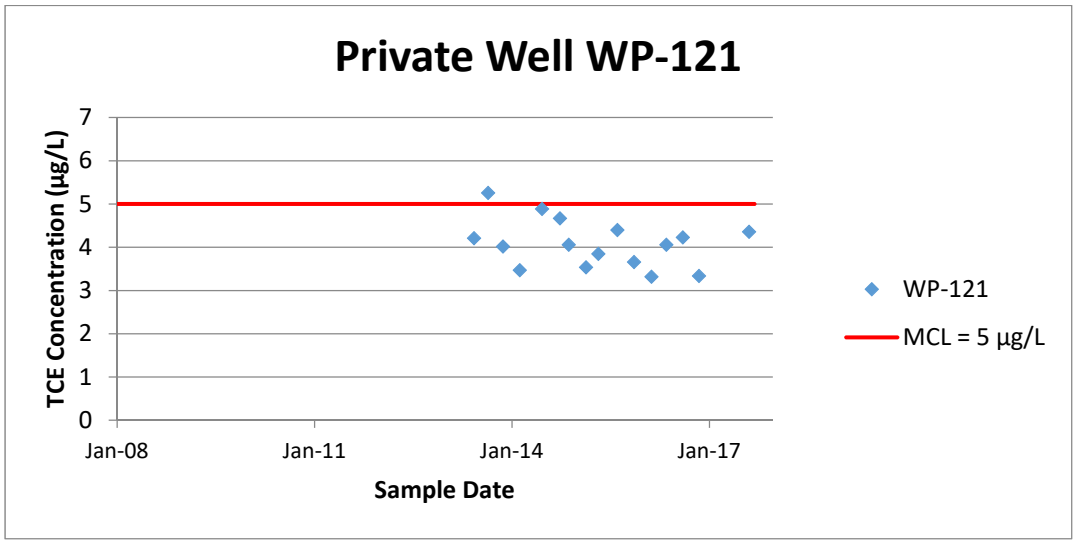

Private Well WP-111
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-111
MCL = 5 µg/L

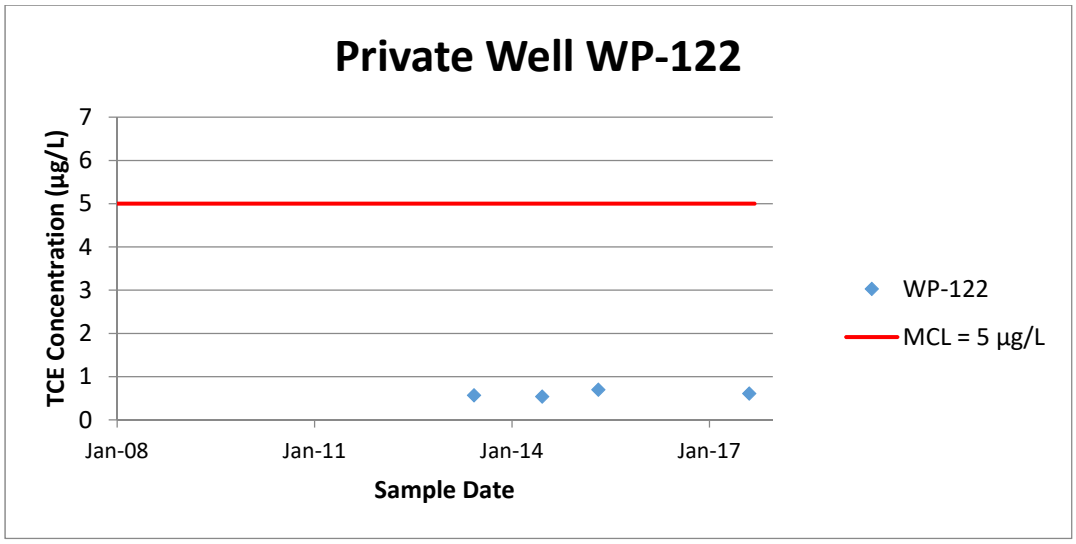

Private Well WP-116
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-116
MCL = 5 µg/L

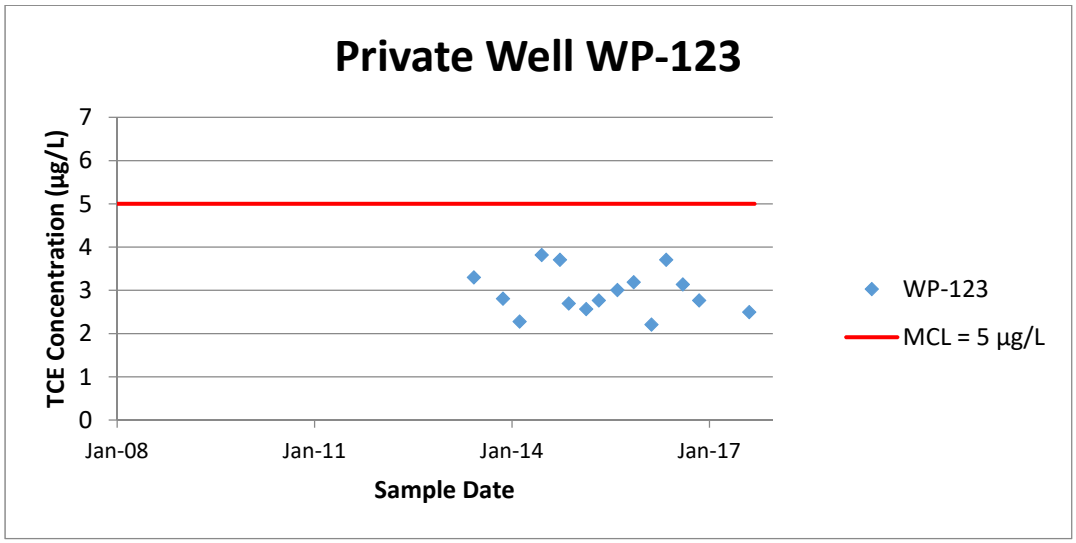

Private Well WP-118
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-118
MCL = 5 µg/L

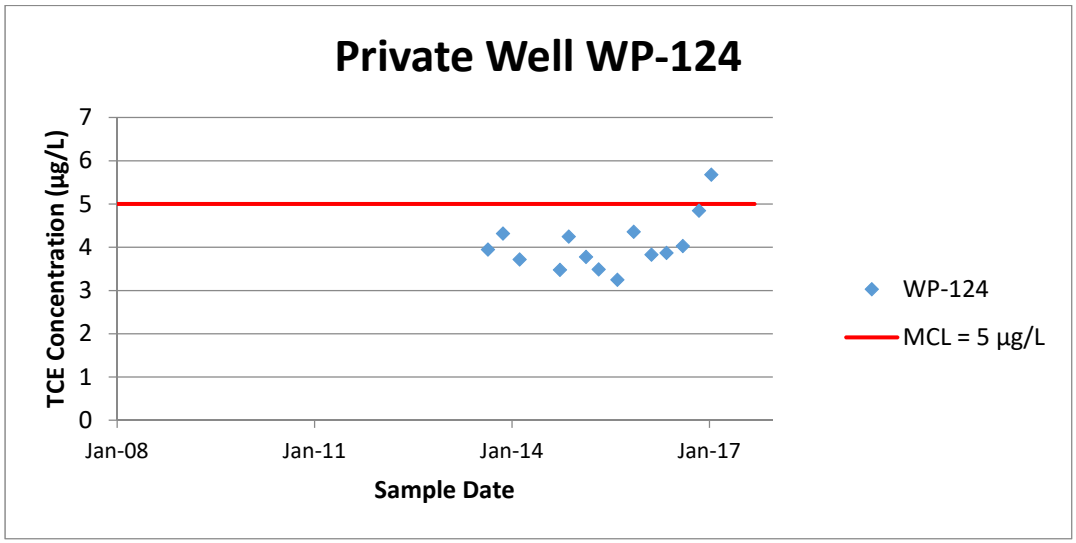

Private Well WP-119
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-119
MCL = 5 µg/L

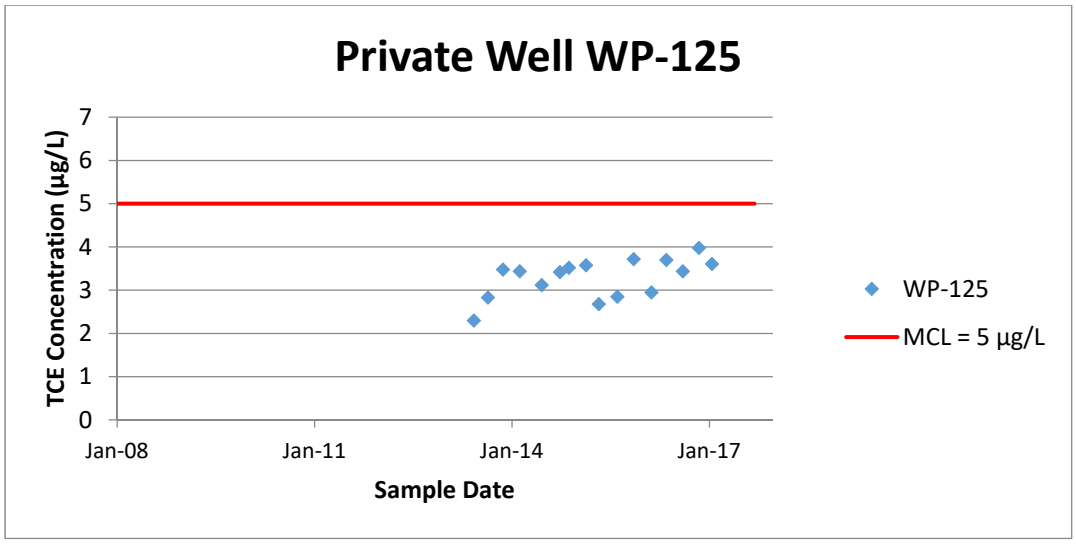

Private Well WP-120
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-120
MCL = 5 µg/L

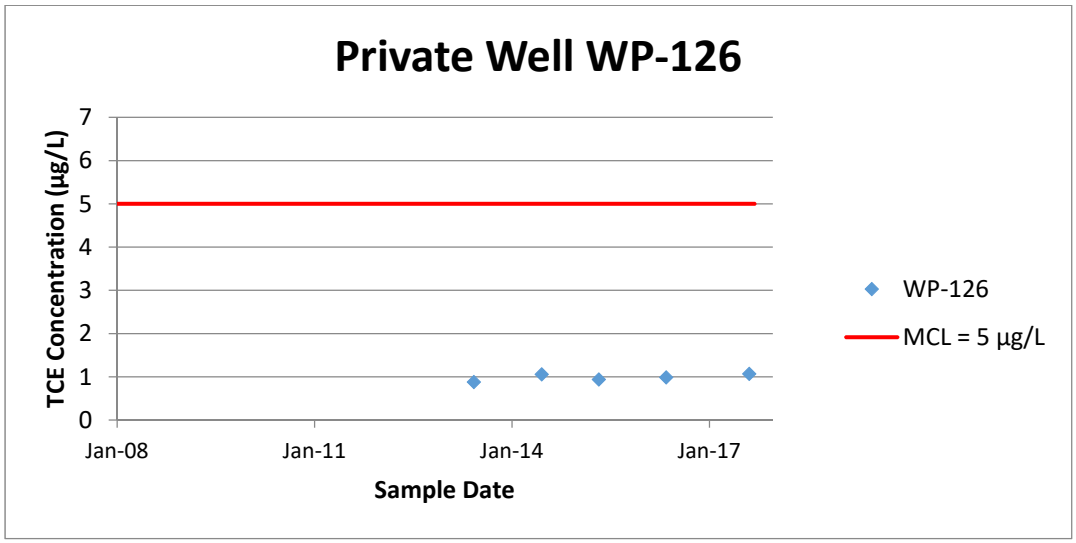

Private Well WP-121
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-121
MCL = 5 µg/L

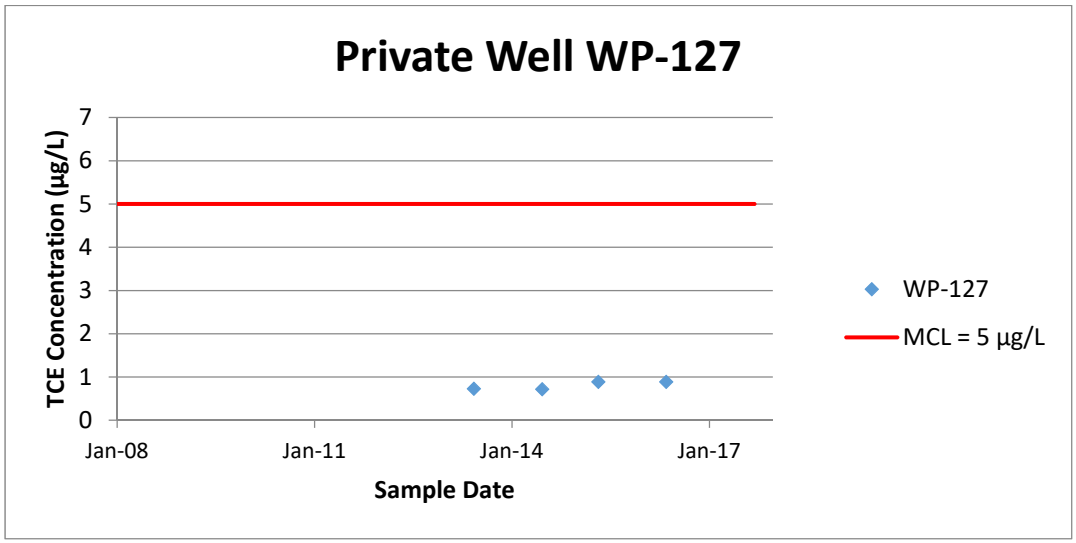

Private Well WP-122
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-122
MCL = 5 µg/L

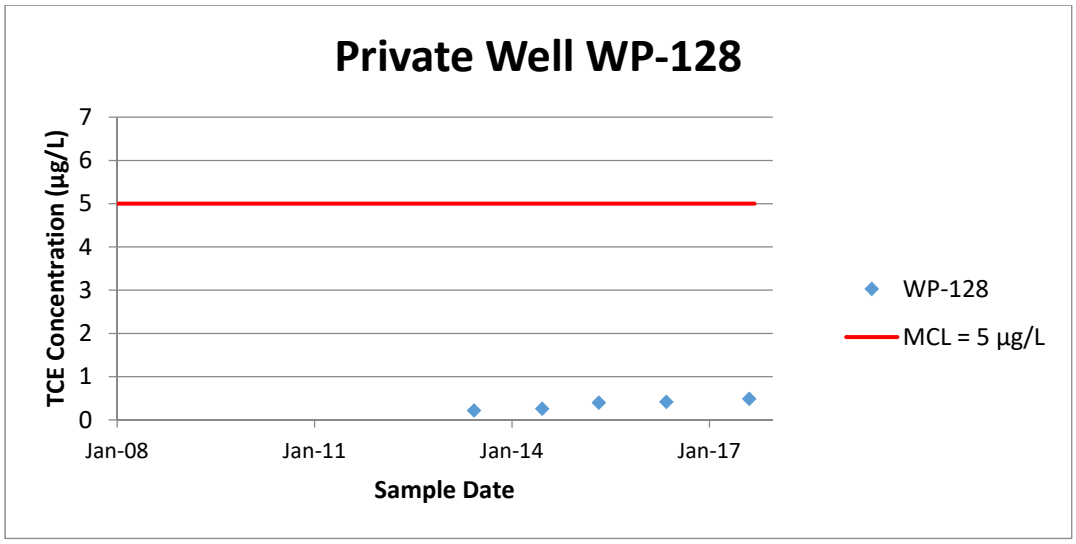

Private Well WP-123
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-123
MCL = 5 µg/L

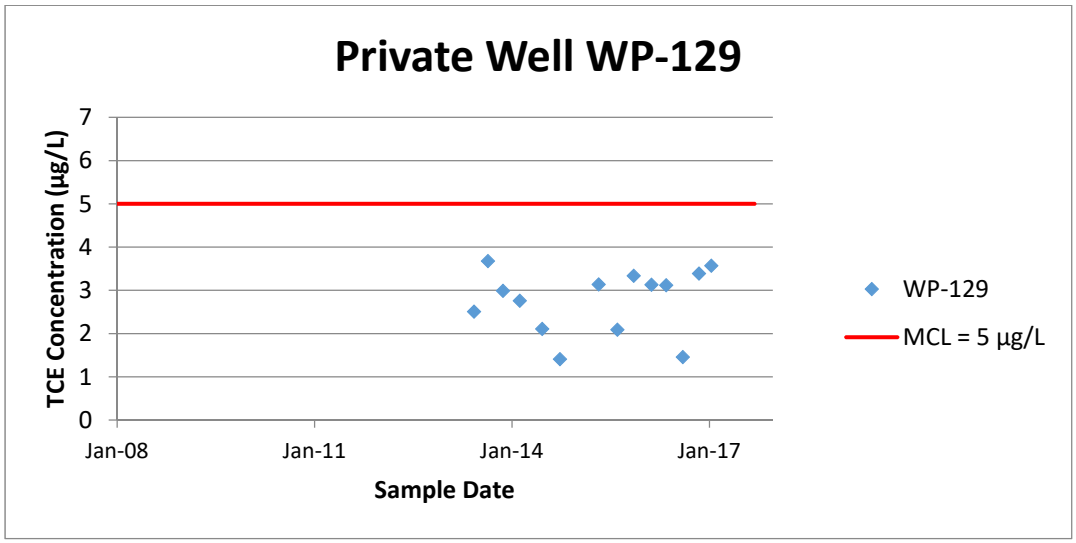

Private Well WP-124
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-124
MCL = 5 µg/L

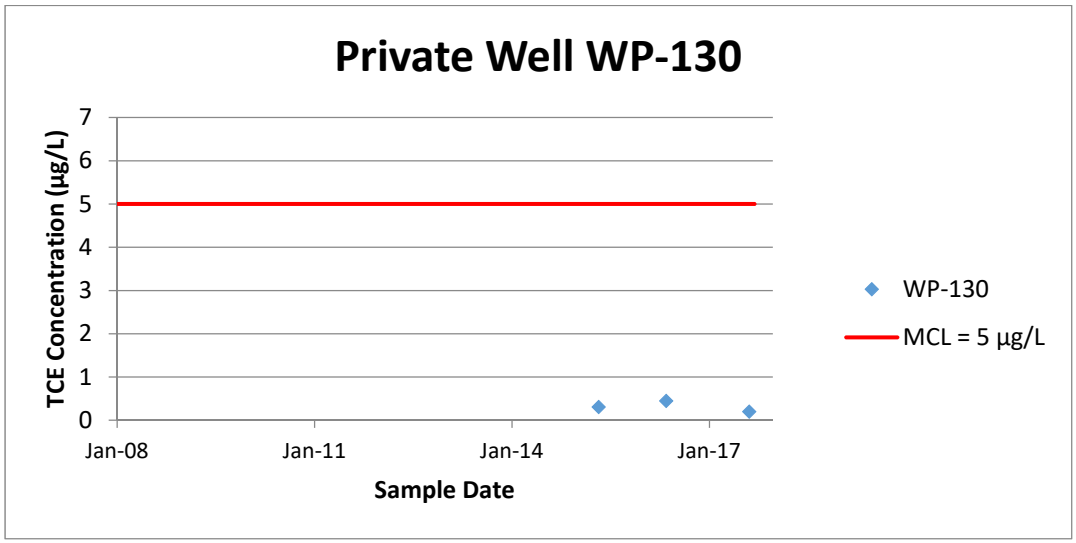

Private Well WP-125
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-125
MCL = 5 µg/L

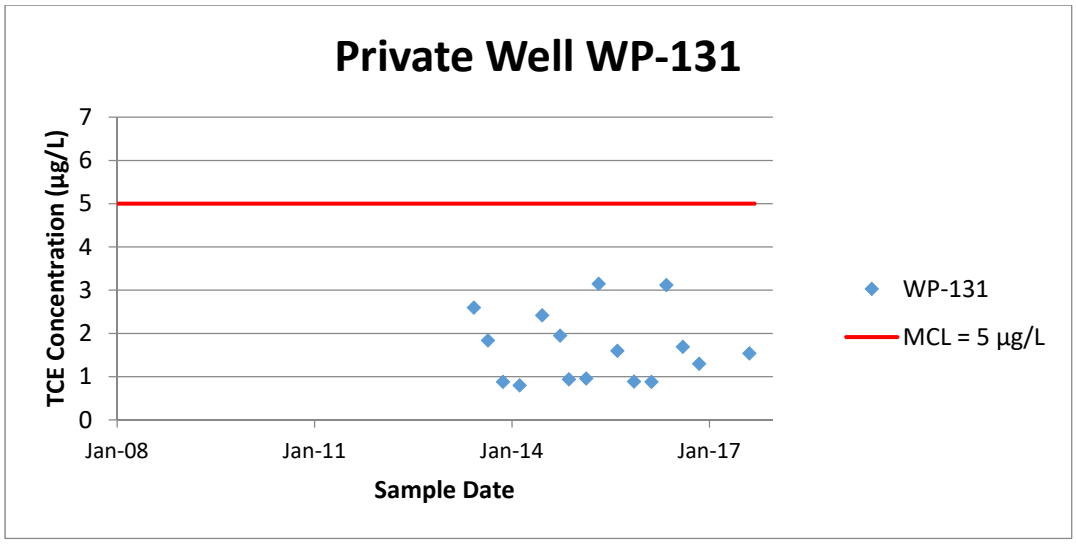

Private Well WP-126
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-126
MCL = 5 µg/L

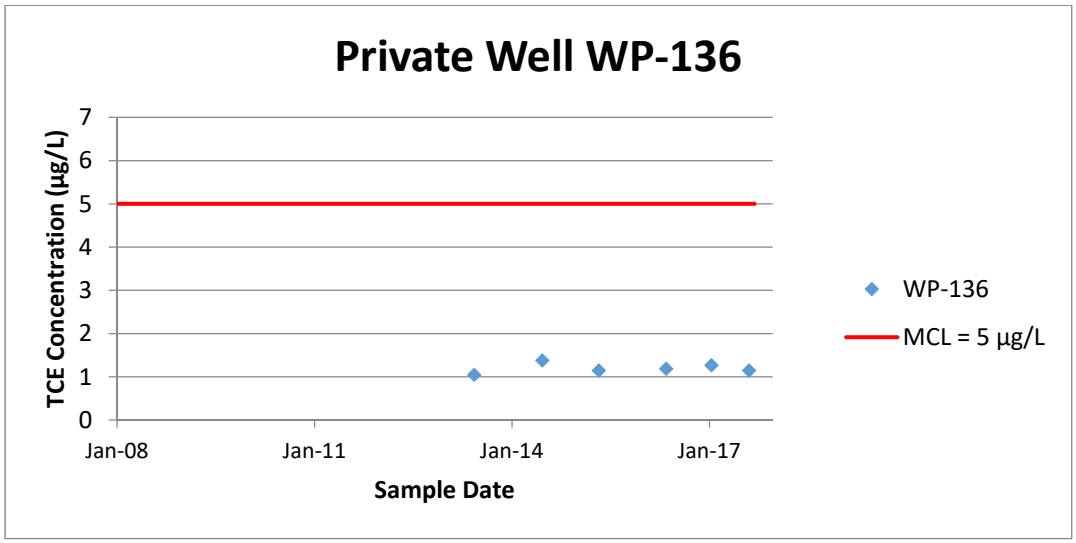

Private Well WP-127
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-127
MCL = 5 µg/L

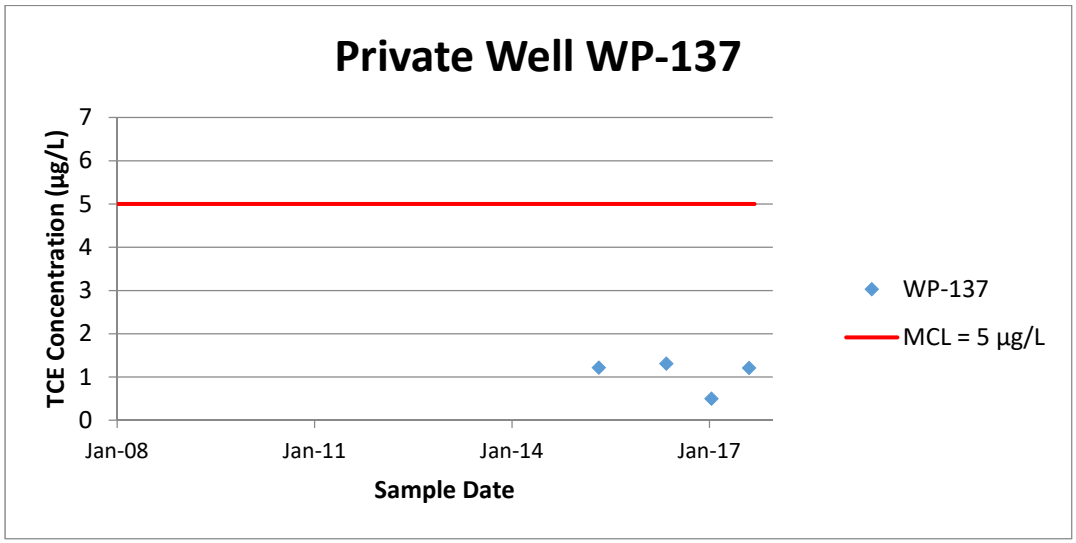

Private Well WP-128
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-128
MCL = 5 µg/L

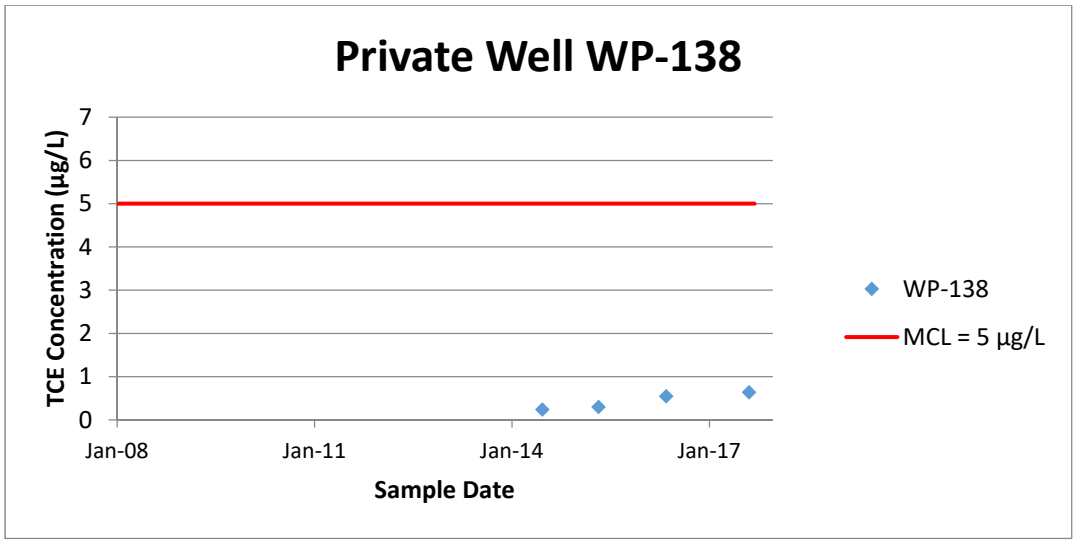

Private Well WP-129
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-129
MCL = 5 µg/L

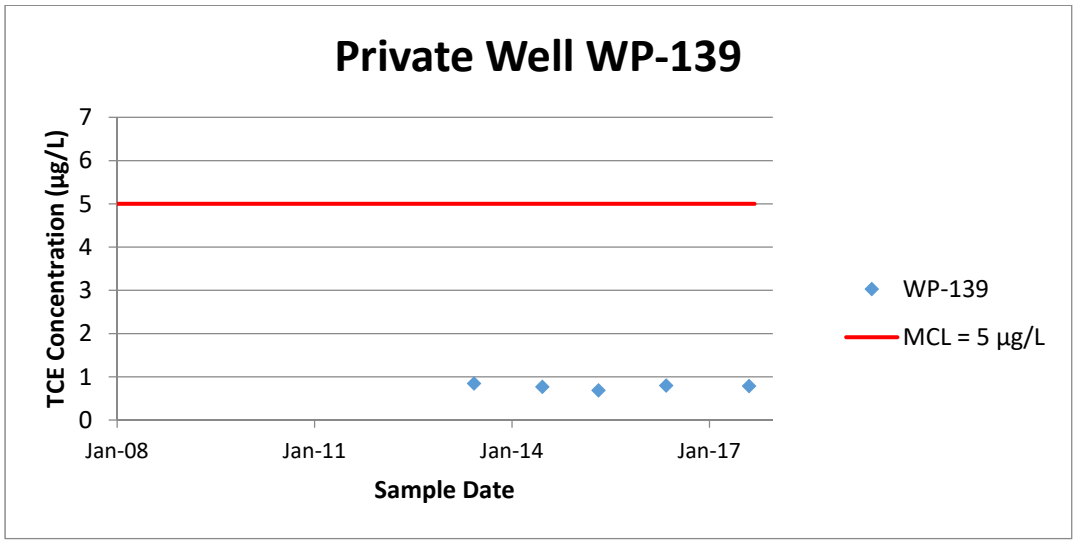

Private Well WP-130
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-130
MCL = 5 µg/L

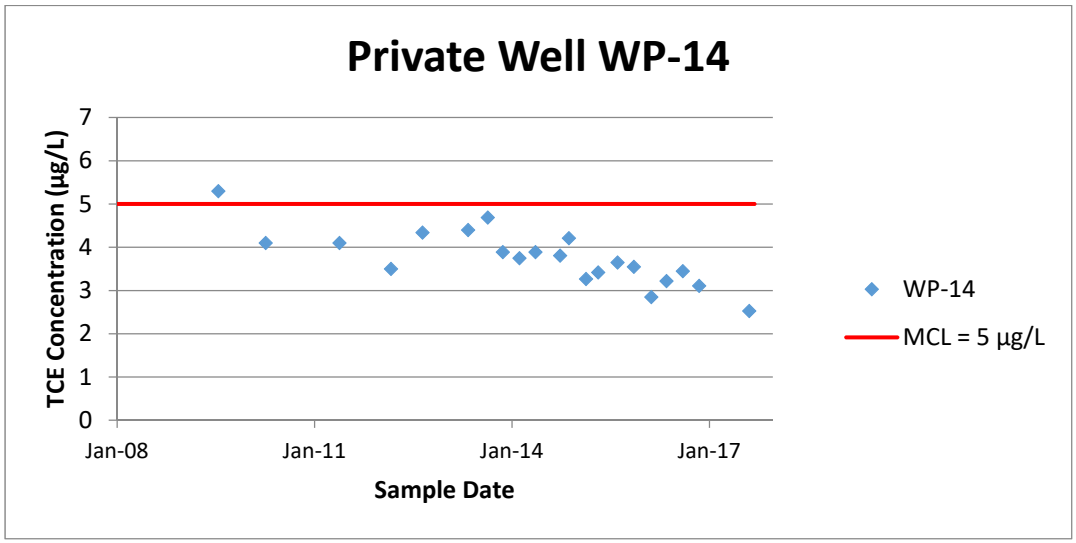

Private Well WP-131
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-131
MCL = 5 µg/L

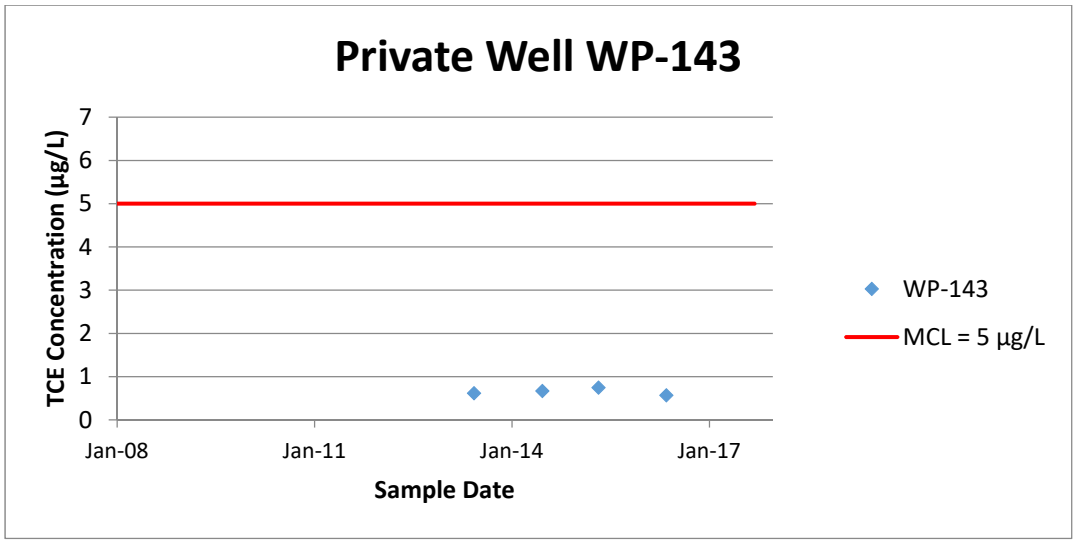

Private Well WP-136
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-136
MCL = 5 µg/L

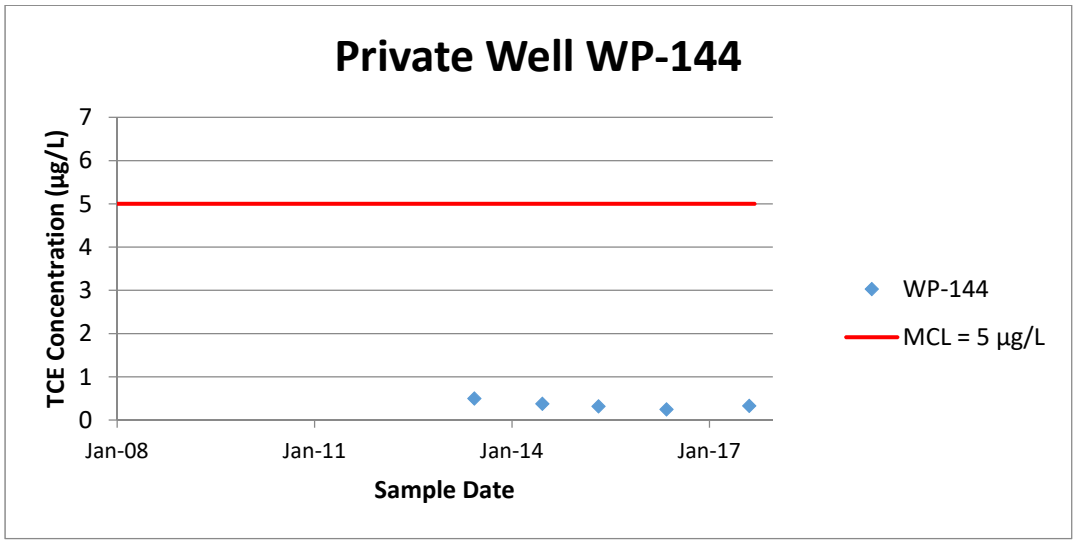

Private Well WP-137
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-137
MCL = 5 µg/L

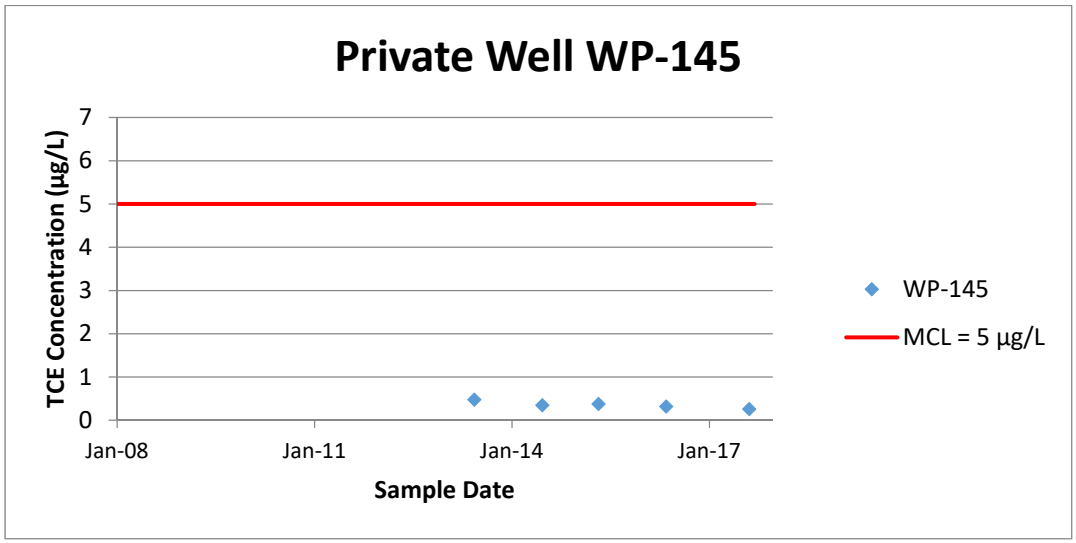

Private Well WP-138
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-138
MCL = 5 µg/L

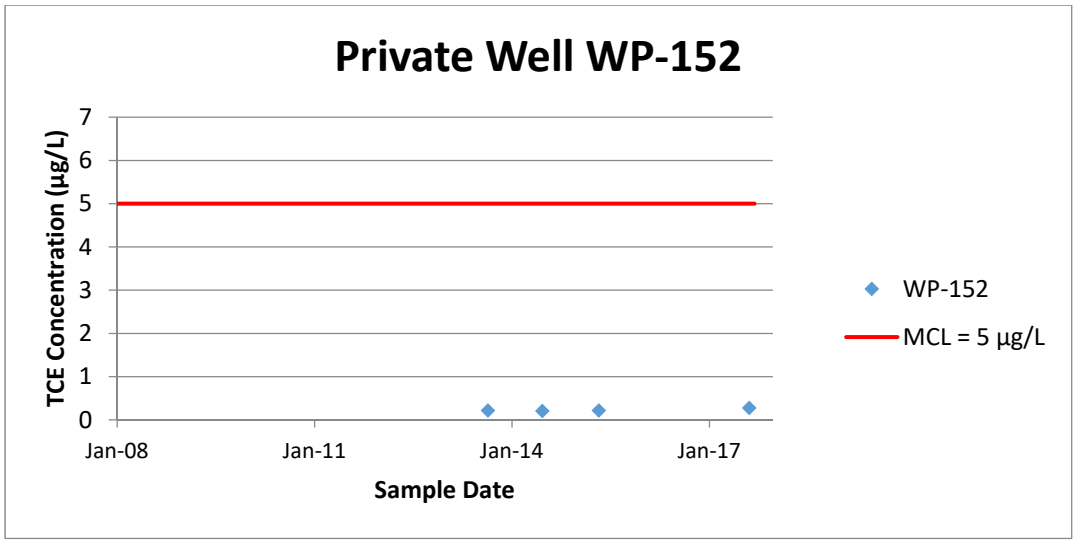

Private Well WP-139
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-139
MCL = 5 µg/L

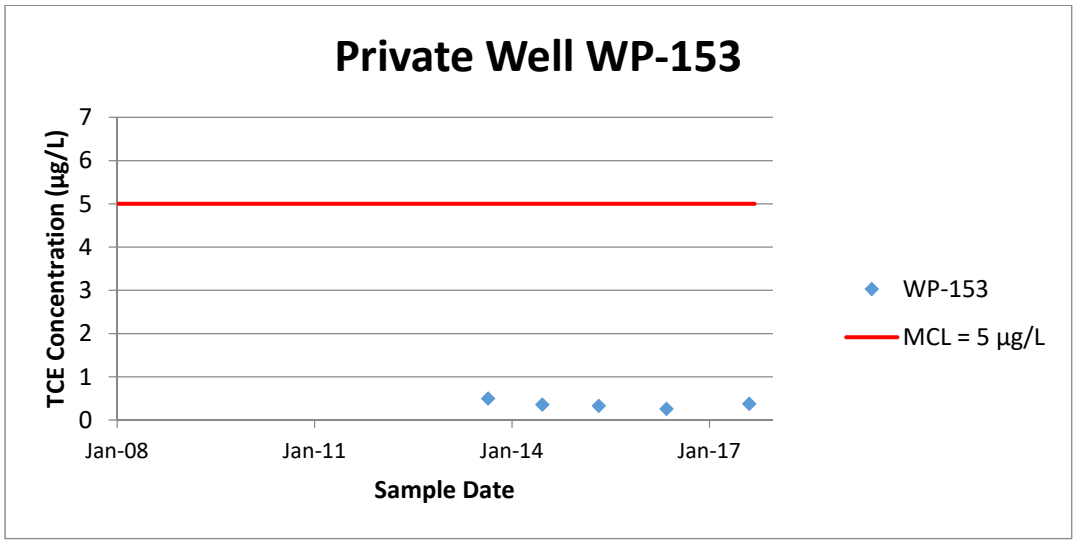

Private Well WP-14
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-14
MCL = 5 µg/L

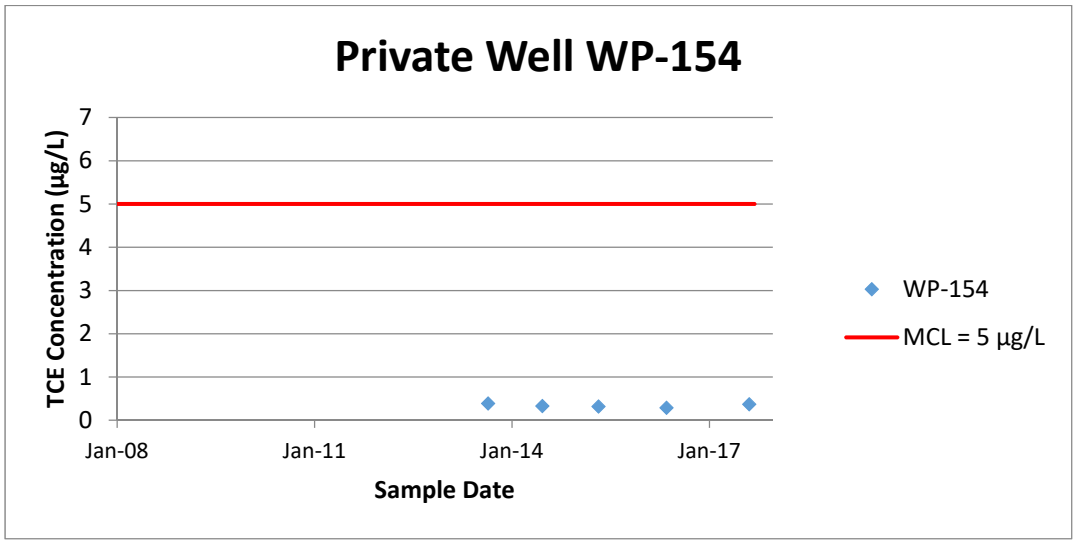

Private Well WP-143
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-143
MCL = 5 µg/L

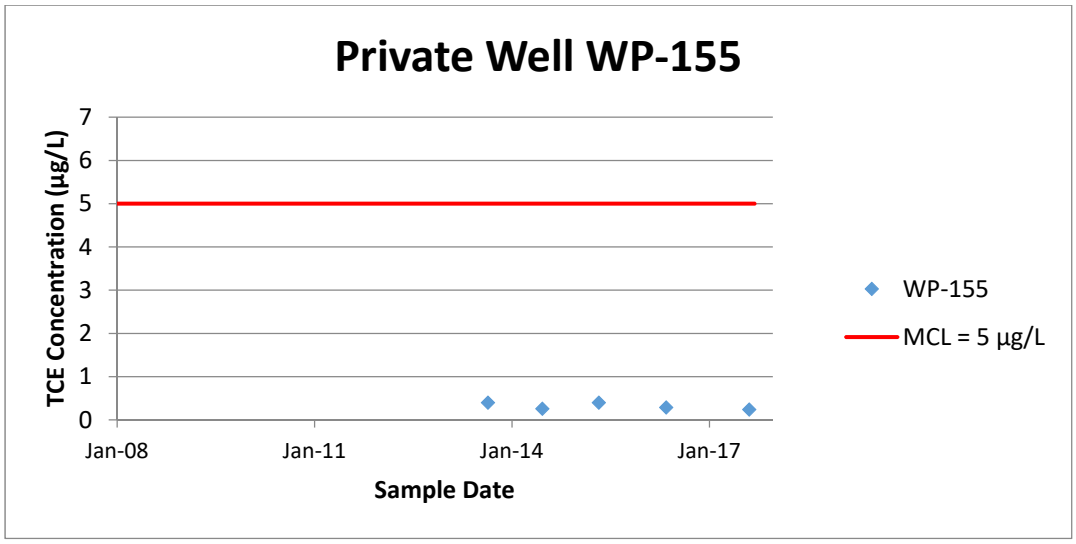

Private Well WP-144
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-144
MCL = 5 µg/L

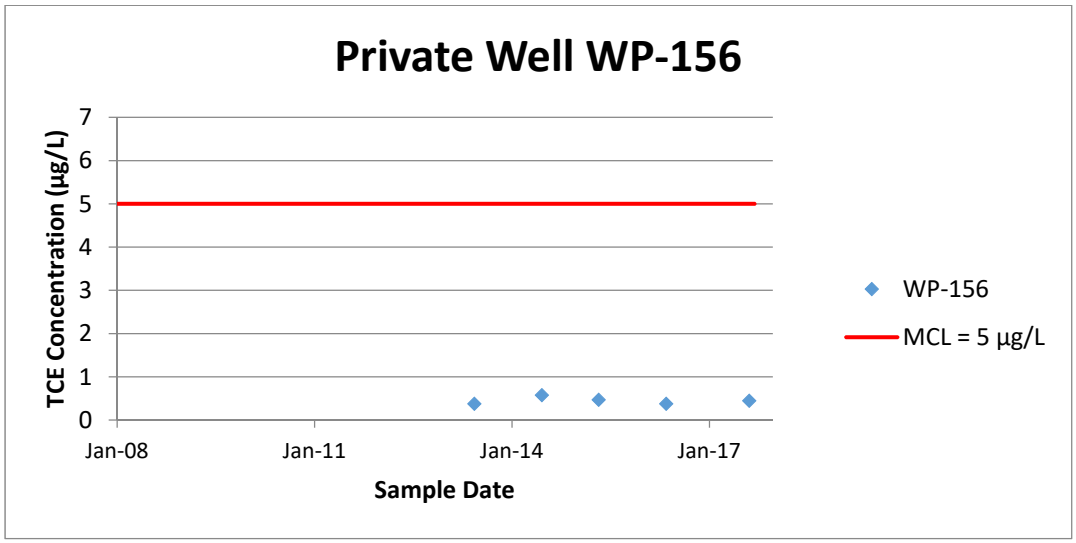

Private Well WP-145
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-145
MCL = 5 µg/L

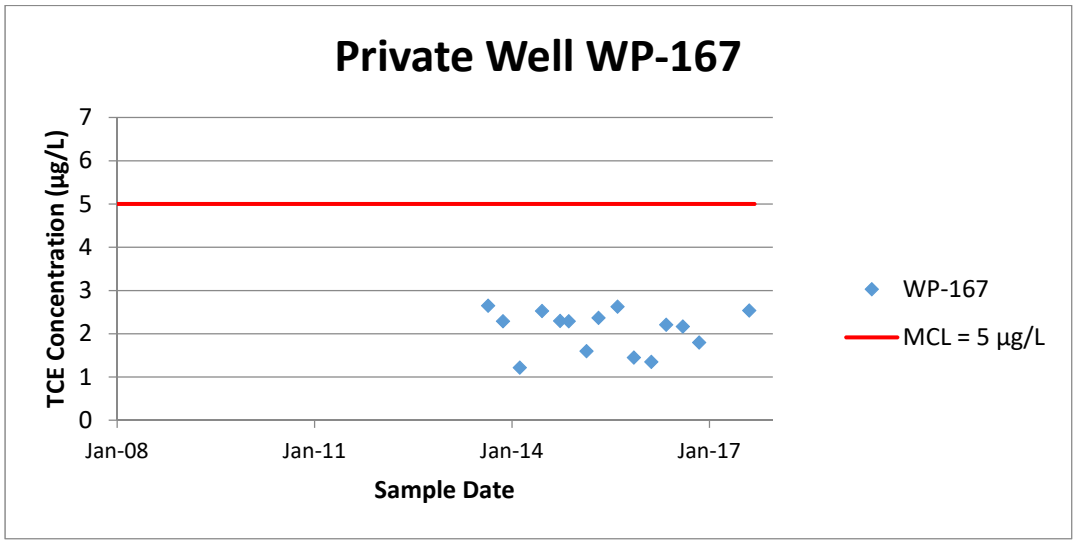

Private Well WP-152
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-152
MCL = 5 µg/L

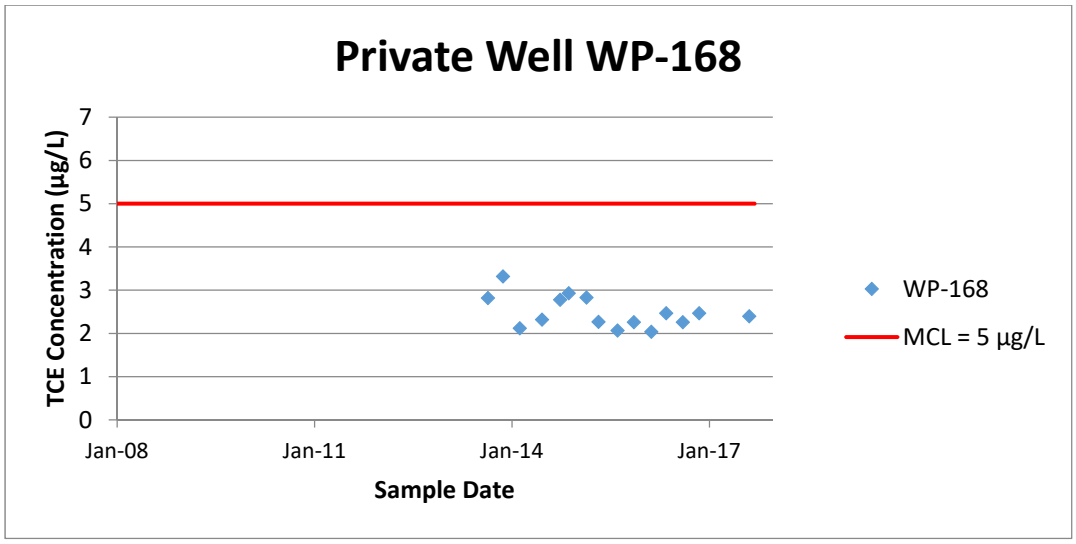

Private Well WP-153
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-153
MCL = 5 µg/L

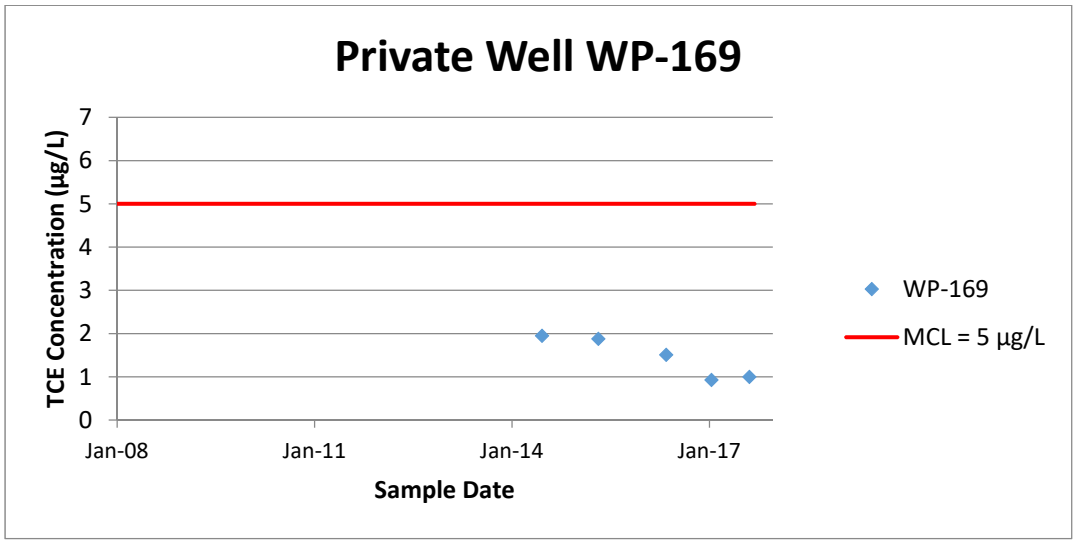

Private Well WP-154
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-154
MCL = 5 µg/L

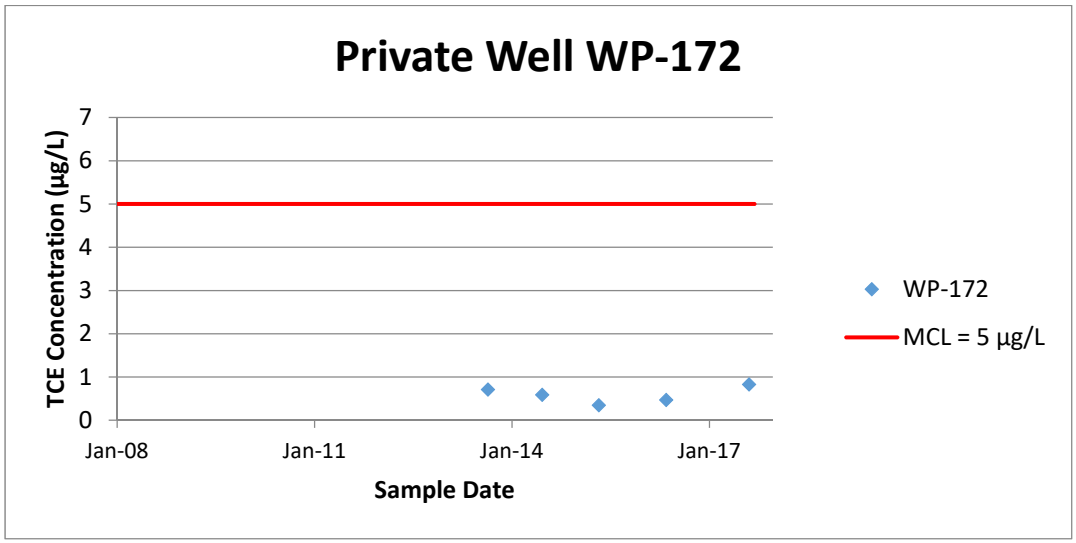

Private Well WP-155
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-155
MCL = 5 µg/L

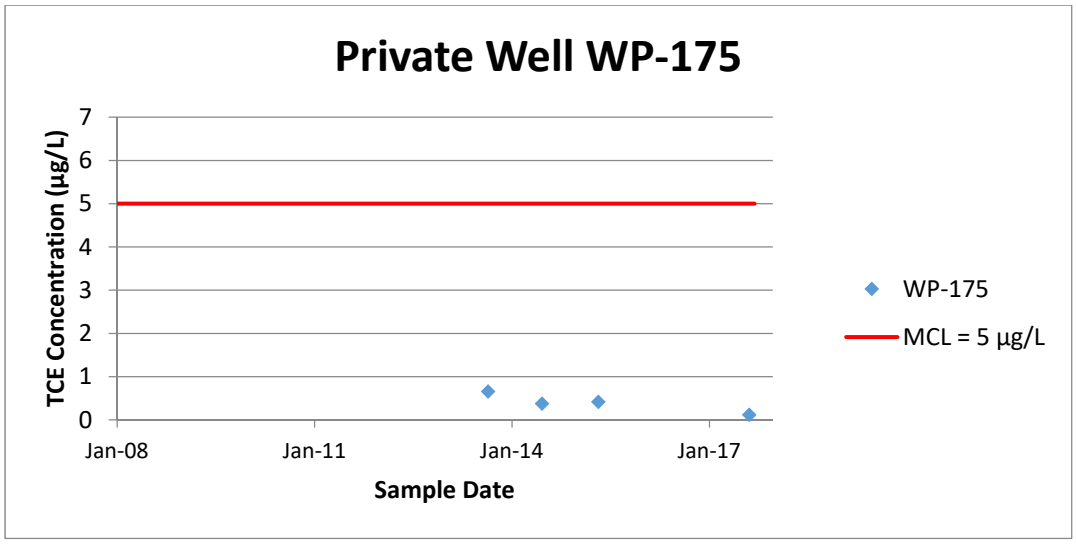

Private Well WP-156
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-156
MCL = 5 µg/L

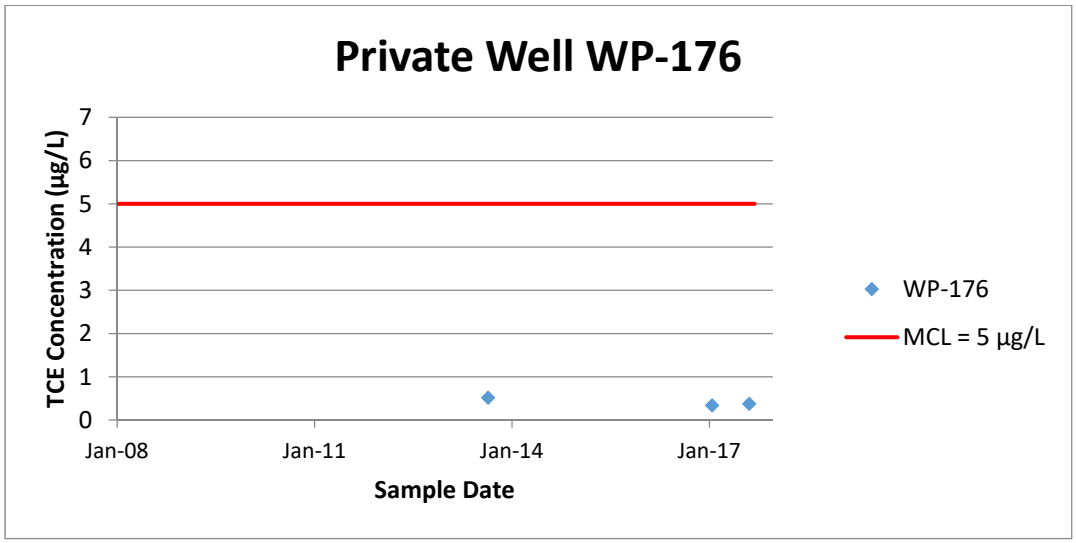

Private Well WP-167
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-167
MCL = 5 µg/L

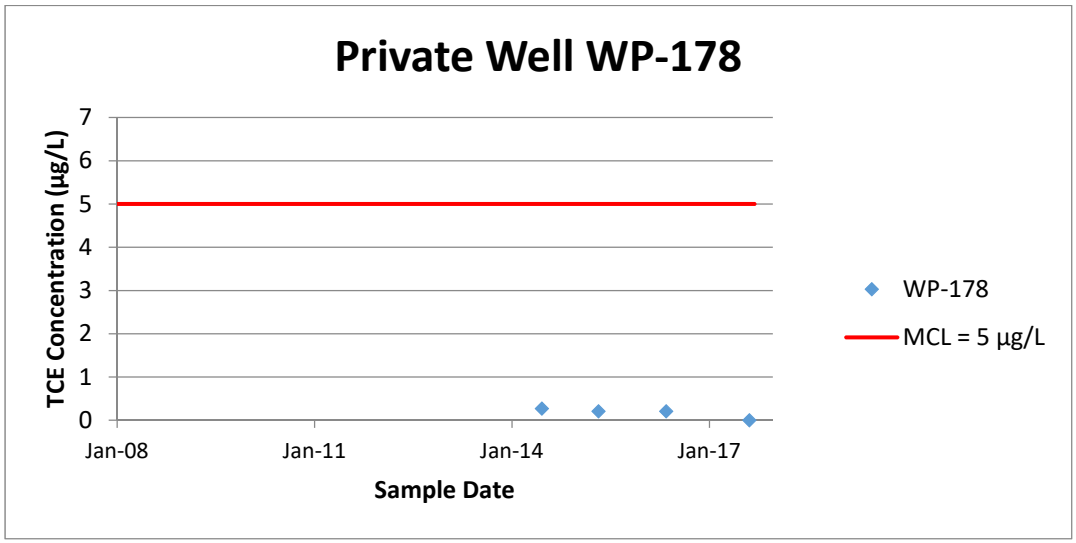

Private Well WP-168
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-168
MCL = 5 µg/L

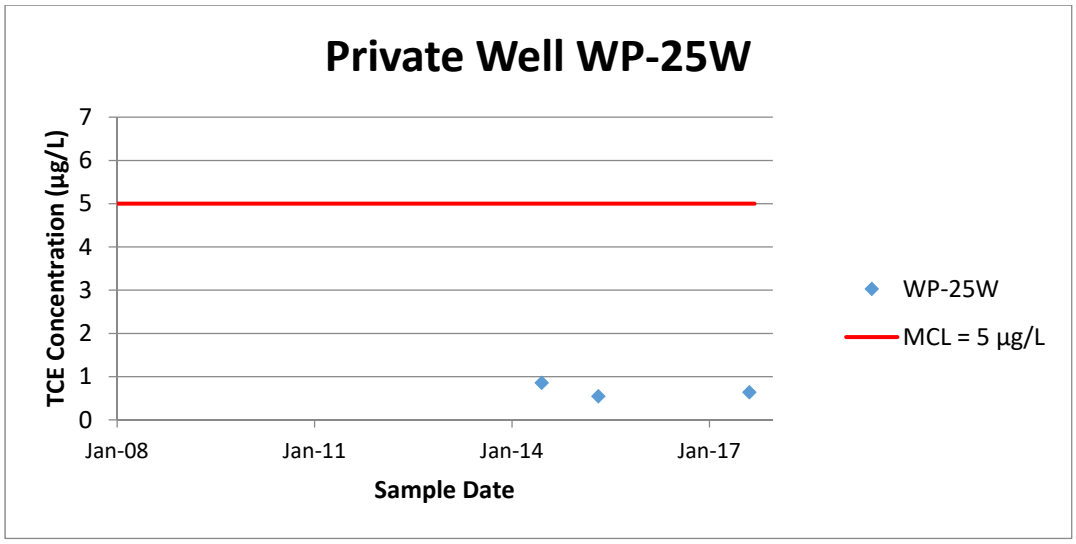

Private Well WP-169
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-169
MCL = 5 µg/L

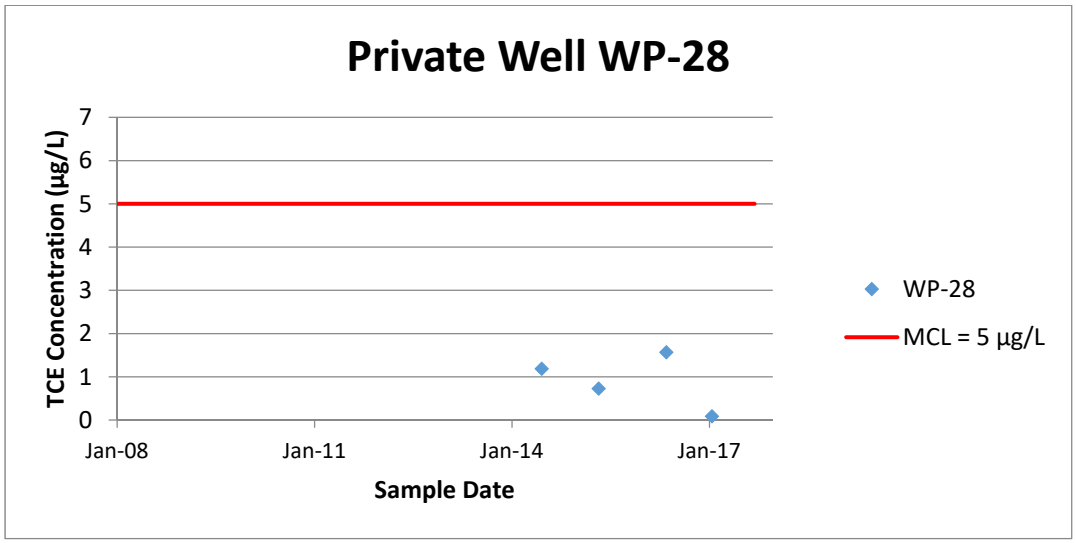

Private Well WP-172
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-172
MCL = 5 µg/L

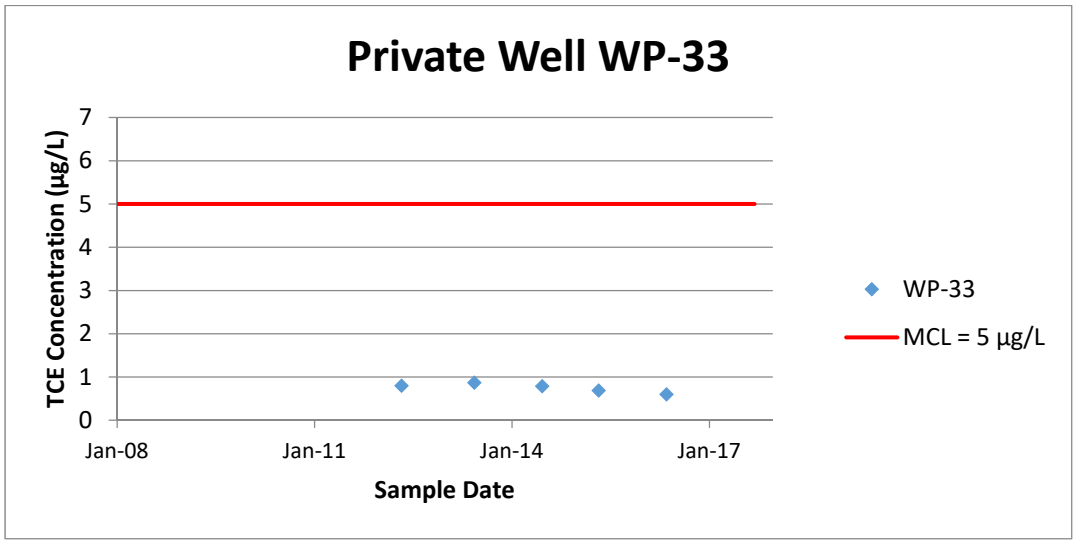

Private Well WP-175
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-175
MCL = 5 µg/L

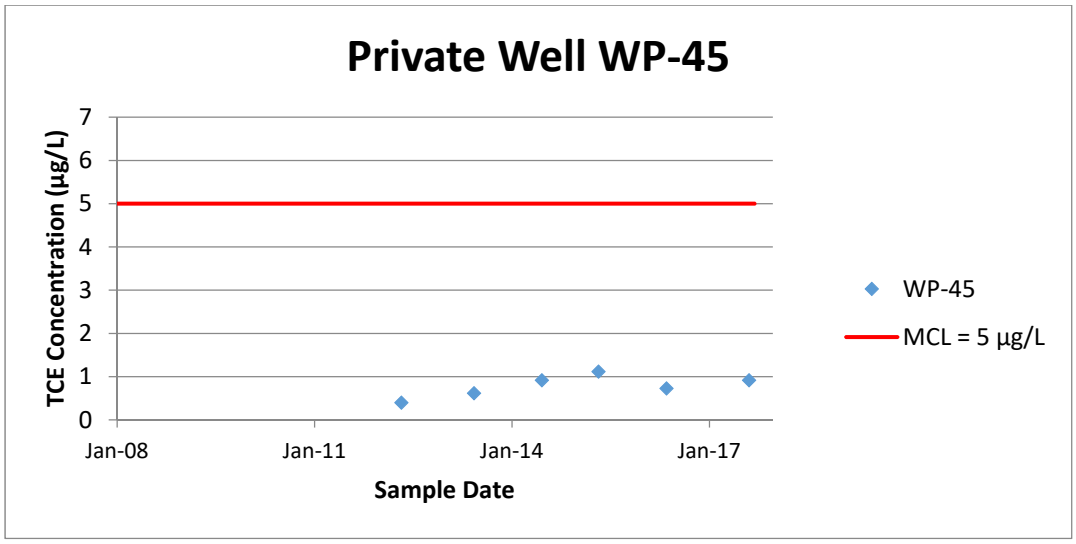

Private Well WP-176
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-176
MCL = 5 µg/L

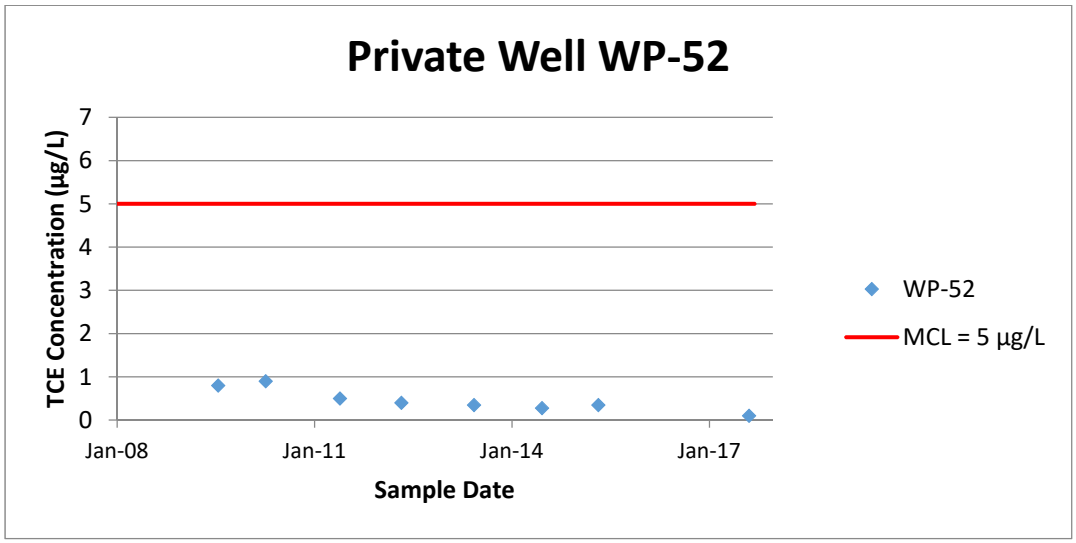

Private Well WP-178
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-178
MCL = 5 µg/L

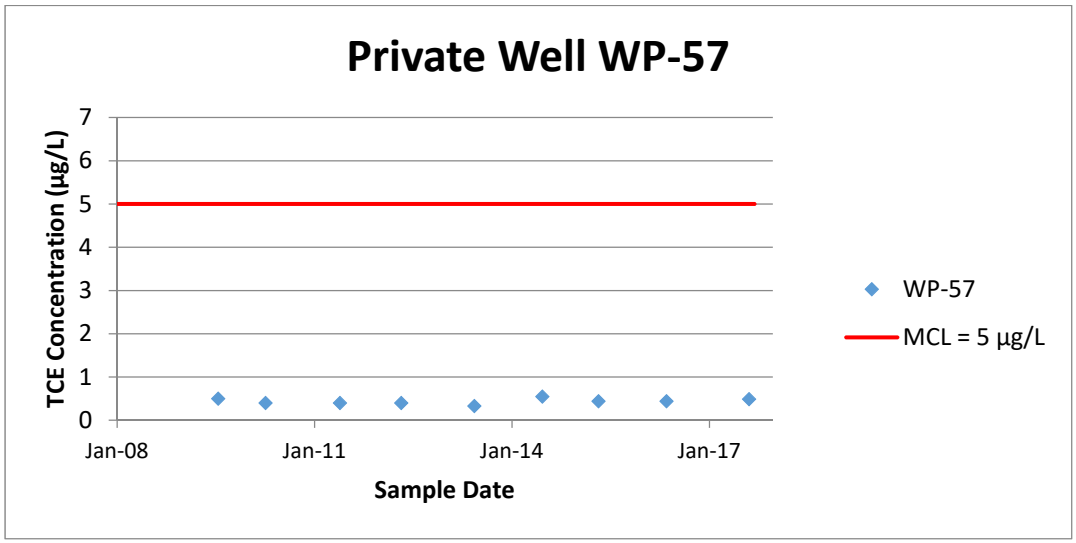

Private Well WP-25W
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-25W
MCL = 5 µg/L

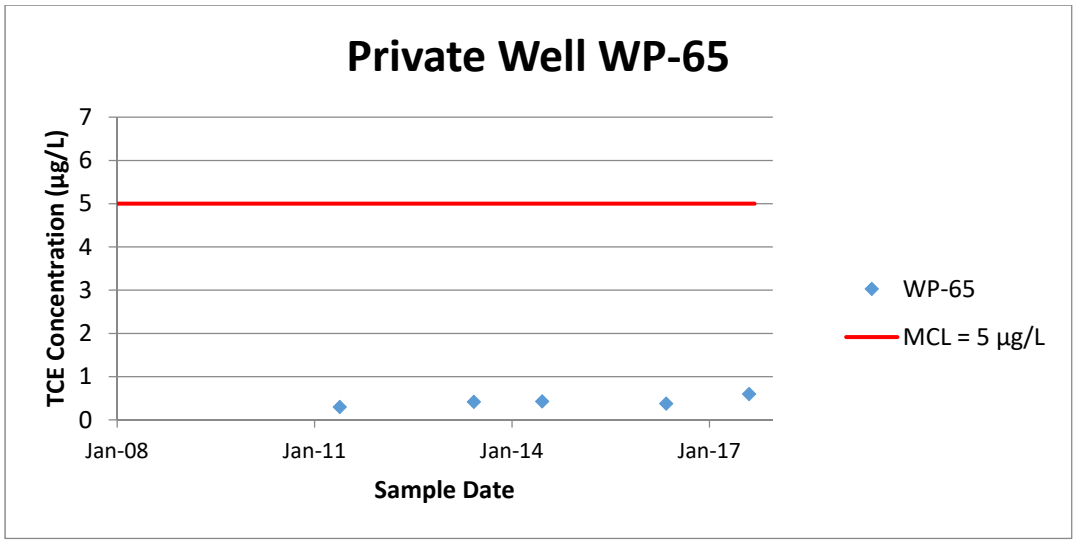

Private Well WP-28
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-28
MCL = 5 µg/L

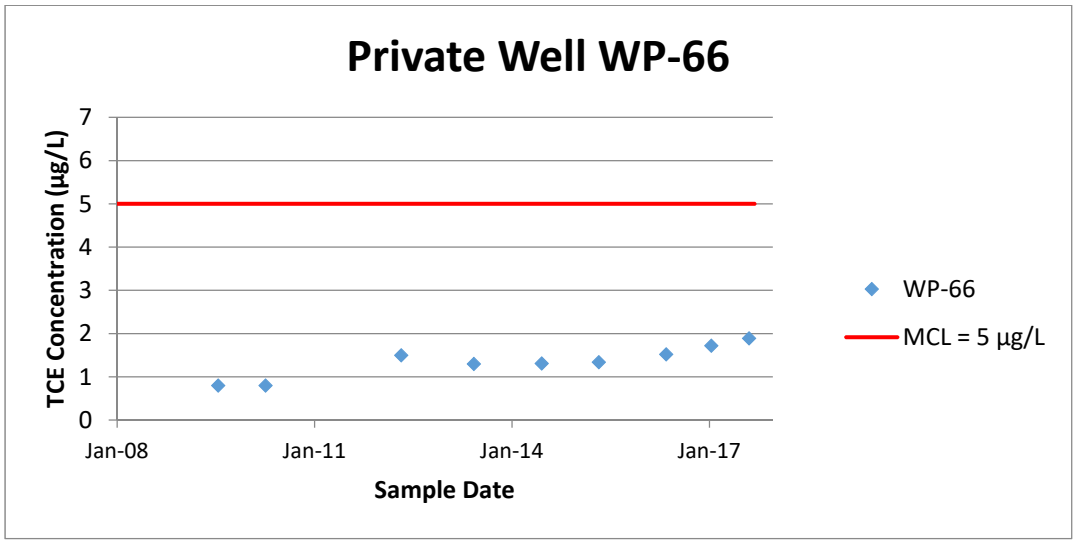

Private Well WP-33
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-33
MCL = 5 µg/L

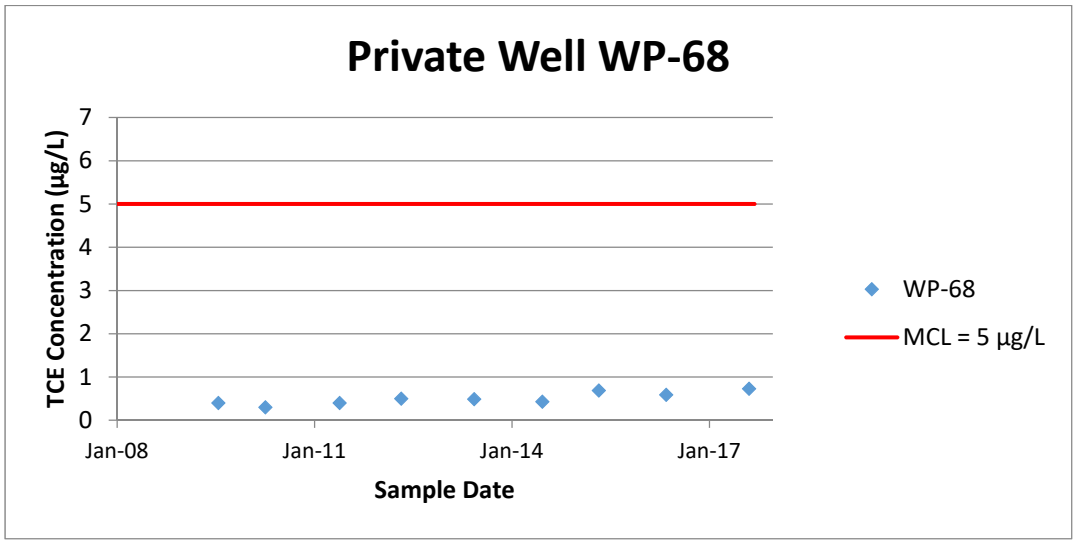

Private Well WP-45
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-45
MCL = 5 µg/L

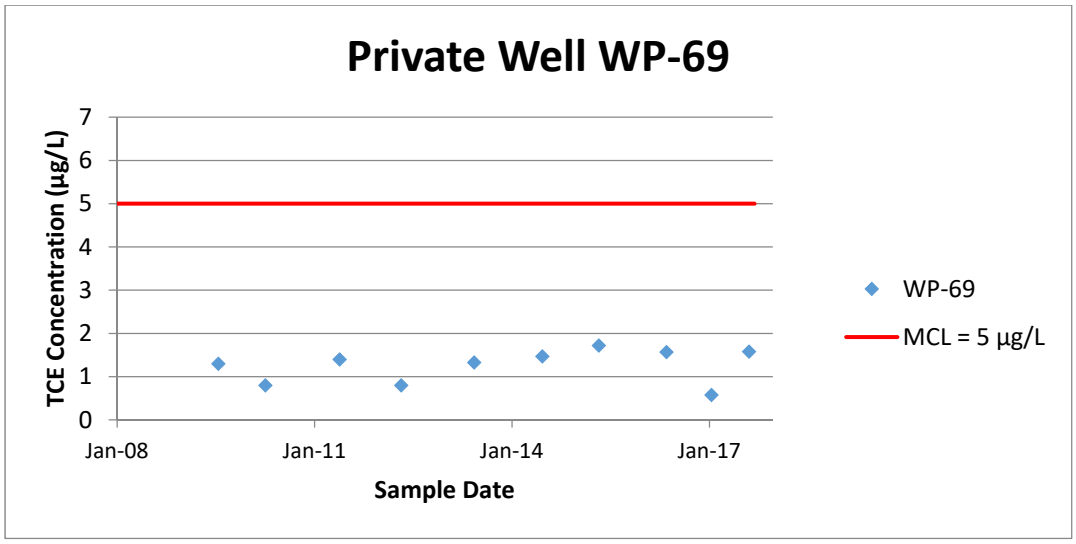

Private Well WP-52
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-52
MCL = 5 µg/L

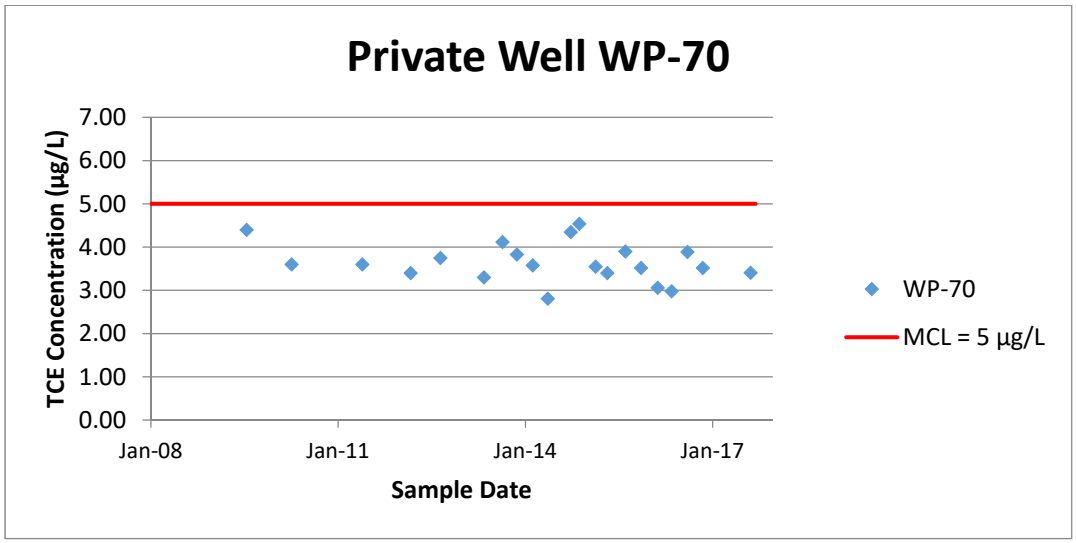

Private Well WP-57
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-57
MCL = 5 µg/L

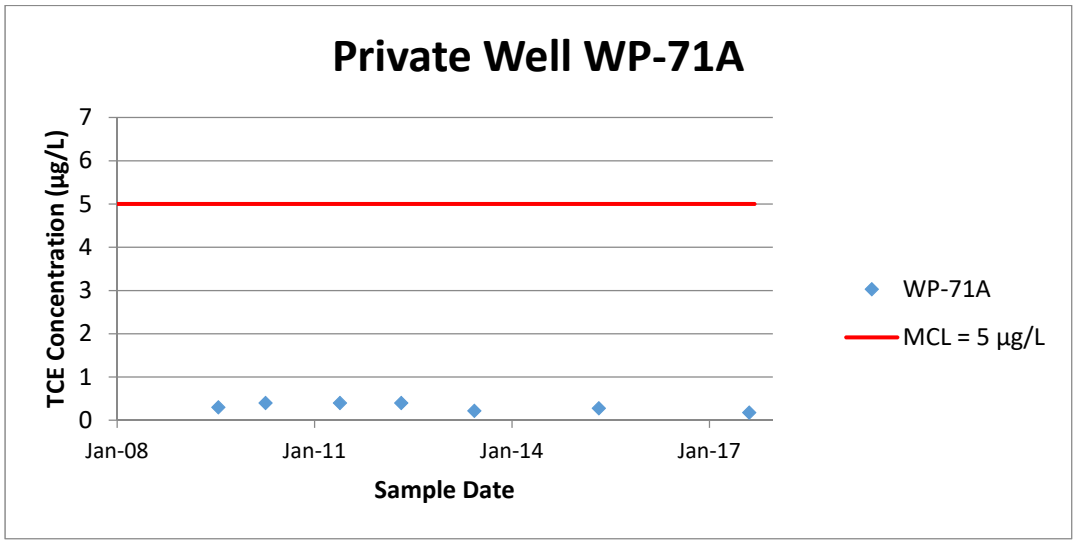

Private Well WP-65
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-65
MCL = 5 µg/L

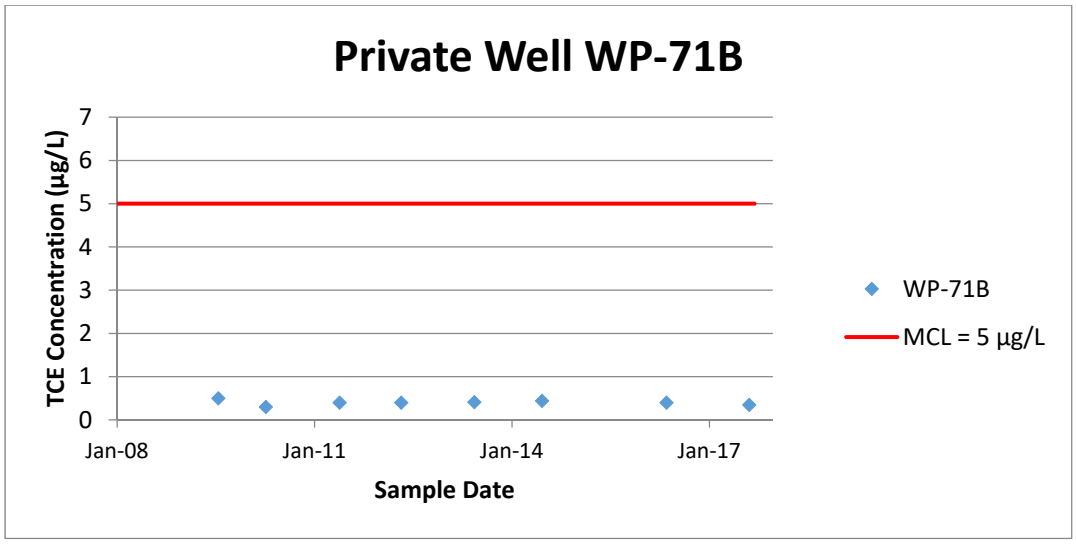

Private Well WP-66
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-66
MCL = 5 µg/L

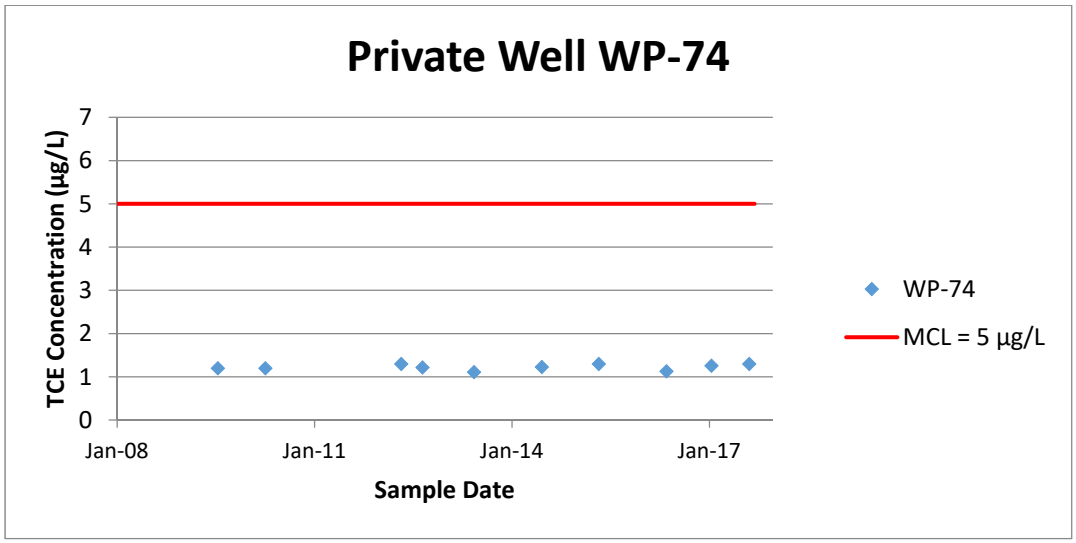

Private Well WP-68
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-68
MCL = 5 µg/L

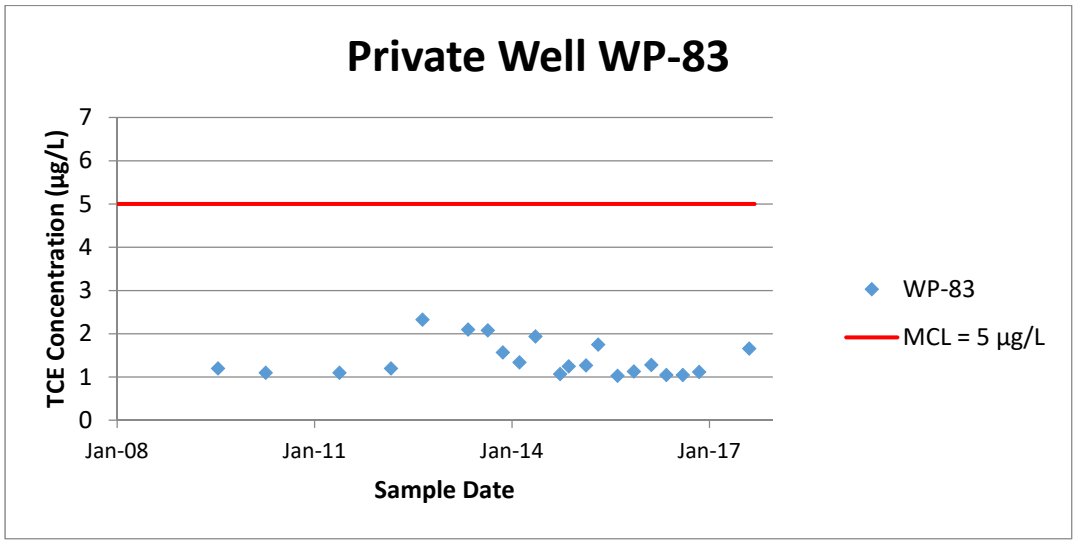

Private Well WP-69
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-69
MCL = 5 µg/L

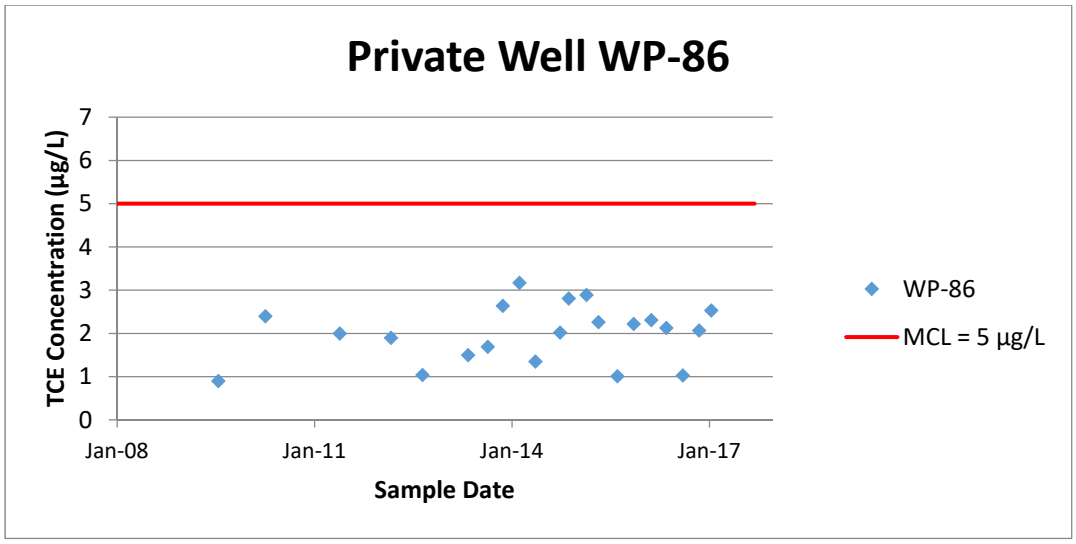

Private Well WP-70
TCE Concentration (µg/L)
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-70
MCL = 5 µg/L


Private Well WP-71A
TCE Concentration (µg/L)
7
6
5
4
3
2
1
0
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-71A
MCL = 5 µg/L


Private Well WP-71B
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-71B
MCL = 5 µg/L


Private Well WP-74
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-74
MCL = 5 µg/L


Private Well WP-83
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-83
MCL = 5 µg/L


Private Well WP-86
TCE Concentration (µg/L)
0
1
2
3
4
5
6
7
Jan-08
Jan-11
Jan-14
Jan-17
Sample Date
WP-86
MCL = 5 µg/L

APPENDIX D - Laboratory Data Packages (CD only)

APPENDIX E - Quality Control Summary Report

Final

QUALITY CONTROL SUMMARY REPORT

2017

MOSES LAKE WELLFIELD SUPERFUND SITE

GROUNDWATER MONITORING AND WHOLE HOUSE FILTER PROGRAM

MOSES LAKE, WASHINGTON

CERCLIS ID# WA988466355

Prepared by

U.S. ARMY CORPS OF ENGINEERS

SEATTLE DISTRICT

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REGION 10

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February 2017

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Contents

ACRONYMS AND ABBREVIATIONS

ADR	Automated Data Review
DOD	Department of Defense
eQAPP	Electronic Quality Assurance Project Plan
EPA	U.S. Environmental Protection Agency
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PCB	Polychlorinated biphenyls
QAPP	Quality Assurance Project Plan
QC	Quality Control
QSM	Quality Systems Manual
RPD	Relative Percent Difference
SDG	Sample Delivery Group
TCMX	Tetrachloro-m-xylene
TOC	Total Organic Carbon
USACE	U.S. Army Corps of Engineers Seattle District
%R	Percent Recovery
mg/L	Milligrams per liter
ug/L	Micrograms per liter

1 Introduction

This Quality Control Summary Report (QCSR) presents Stage 2a and Stage 4 data validation results for samples collected during the January 2017 through August 2017 sampling period. Data validation was performed in accordance with the Final 2017 Work Plan with Quality Assurance Project Plan - for Moses Lake Wellfield Superfund Site, Moses Lake, Washington (QAPP) (USACE, March 2016), U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.0 (DOD QSM) (DoD, July 2013), and Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (CLPNFG) (USEPA, June 2008). Laboratory Data Consultants, Inc., an independent subcontractor to the U.S. Army Corps of Engineers, Seattle District (USACE), performed the data validation task.

This QCSR was based on the outcome of the data review and data validation performed on all laboratory reports submitted by Analytical Resources, Inc. in Tukwila, WA.

The purpose of this QCSR is to provide the project management and data end-users (1) an overview of data quality in terms of precision, accuracy, representativeness, comparability, sensitivity, and completeness, (2) specific data quality anomalies and their effects on data usability, and (3) recommendations to the extent of data usage.

Following the requirements outlined in the QAPP, samples were analyzed with analytical protocols defined in:

- Measurement of Purgeable Organic Compounds in Water by Capillary Column Gas Chromatography/Mass Spectrometry (Method 524.3) EPA 815-B-09-009, June 2009.

2 Quality Control Activities

During the January 2017 through August 2017 sampling events a total of 229 samples analyzed for volatile organic compounds (VOCs). The sample identification, collection dates, analyses requested/performed, and validation levels and well identification numbers (IDs) are presented in the DVR (Appendix F of 2017 Annual Report).

All sample results were subjected to Stage 2a data validation, which consists of an evaluation of quality control (QC) summary results for sample holding times, surrogates, matrix spike/matrix spike duplicates (MS/MSD), laboratory control sample/laboratory control sample duplicates (LCS/LCSD), method blanks, trip blanks, field blanks, equipment blanks, and field duplicate samples.

A Stage 4 evaluation of the quality control (QC) summary forms as well as initial and continuing calibrations and the raw data was performed on only private drinking water wells.

Based on the data review, the chain-of-custody (COC) forms and sample receipt forms submitted in the analytical reports were clear and complete in most cases. Cooler temperatures were within the 4±2°C criteria, with the exceptions of two coolers in January and one cooler submitted during the August sampling event.

3 Data Quality Assessment

Based on the outcomes of the data validation, the following sections evaluate if the quality of the data collected during this sampling event achieves the data quality objectives (DQOs) specified in the QAPP. Data quality was determined based on various quality measures commonly referred to as data quality indicators (DQIs) - precision, accuracy/bias, representativeness, comparability, completeness and sensitivity (quantitation limits).

3.1 Data Quality Indicators

Data quality indicators are defined in the following sections. Quality control (QC) parameters evaluated in the data review/validation and the corresponding DQIs are presented as attachments to the DVRs. Definitions of the data quality indicators are provided as follows:

3.1.1 Precision

Precision is defined as the degree of mutual agreement among independent measurements as the result of repeated application of the same process under similar conditions. Analytical precision is evaluated via the relative percent difference (RPD) values of matrix spike/matrix spike duplicate (MS/MSD) and laboratory control sample/ laboratory control sample duplicate (LCS/LCSD). The RPD values of field duplicate analyses represent the combined precision of sample collection and analysis procedures, as well as sample heterogeneity.

3.1.2 Accuracy

Accuracy is a statistical measurement of correctness and includes components of random and systematic errors. It is quantified as the degree of agreement between a measurement with a known reference. Analytical accuracy is evaluated via the percent recovery (%R) values of initial and continuing calibration (percent difference [%D] or percent drift [%Df]), internal standards, surrogate spikes, MS/MSD, LCS/LCSD, in conjunction with method blank, trip blank, and field blank results. Results of blanks assist in identifying the type and magnitude of effects contributed to the system error introduced via field and/or laboratory procedures.

3.1.3 Representativeness

Representativeness is the level of confidence that the analytical data reflects the actual field condition. Representativeness is ensured by maintaining sample integrity during collection, preparation, and analysis. The evaluation of associated method, trip, and field blanks also assists in identifying artifacts that may skew the representativeness of the samples.

3.1.4 Comparability

Comparability is the confidence with which one data set can be compared to another data set. Using standard methods throughout the data generation processes ensures the comparability of data generated in separate sampling days or events.

3.1.5 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions. Data is complete and valid if it meets all acceptance criteria including accuracy, precision, and any other criteria specified by the particular analytical method being used. Four calculations of completeness are specified in the project QAPP.

Contract compliance completeness falling below the target level may result in the issuance of a corrective action request for the project laboratory. Contract compliance failures are usually the result of lack of corrective action. The impact of contract compliance deficiencies varies with the specific correction action failure and is be determined during the data usability assessment.

$$\textit{Contract Completeness} = \frac{\textit{\# contract compliant results x 100\%}}{\textit{\# results reported}}$$

Analytical completeness is used to assess the laboratories ability to generate high quality data. This may be a reflection of contract compliance or other issues and requires detail assessment of the cause for qualification during data usability assessment.

$$\textit{Analytical Completeness} = \frac{\textit{\# unqualified results X 100\%}}{\textit{\# results reported}}$$

(Estimated results are considered as useable for project decision making.)

Technical completeness is a measure which reflects the laboratories ability to produce usable results. The impact of failure to meet this goal will results in serious impacts to data usability (rejected results) and may result in termination of the contract.

$$\textit{Technical Completeness} = \frac{\textit{\# useable results}^{\dagger}\textit{ X 100\%}}{\textit{\# results reported}}$$

Field sampling completeness reflects whether the samples planned for collection were actually acquired.

$$\text{Field Sampling Completeness} = \frac{\text{\# samples collected}}{\text{\# samples planned}} \times 100\%$$

The minimum goals for completeness are as follows: 1) Contract = 100%, 2) Analytical = 90% or greater, 3) Technical = 90% or greater and 4) Field = 100%. The goal for holding times is 100%. Estimated results are treated as usable results for technical completeness. These are considered minimum goals.

3.1.6 Sensitivity

Sensitivity depicts the level of ability an analytical system (i.e., sample preparation and instrumental analysis) of detecting a target component in a given sample matrix with a defined level of confidence. Factors affecting the sensitivity of an analytical system include: analytical system background (e.g., laboratory artifact or method blank contamination), sample matrix (e.g., mass spectrometry ion ratio change, co-elution of peaks, or baseline elevation), instrument instability, and field procedures (including sample transport).

To evaluate if the analytical sensitivity achieved the project expectation, sample-specific project quantitation limits (PQLs) were compared against the reporting limit (RL) goals set forth in the QAPP. In addition, sample results were compared to detections of target analytes in method blanks, and trip blanks to identify potential effects of laboratory background and field procedures on sensitivity.

3.2 Data Quality Indicator Evaluation

The following subsections present an evaluation of the data. The assessment is intended to reconcile the existing data quality with the project DQOs. Assessment is presented herein in terms of the data quality indicators. The qualified data are presented in the DVR attachments.

DQIs for VOC data met the project goals with the following exceptions:

Precision – No RPDs were outside criteria.

Accuracy/Bias – The following QC outliers indicate potential bias of VOC data:

- January 2017: One MS/MSD pair exceeded the %R acceptance criteria for trichloroethene. The associated result in sample 1701NWP124A1 was qualified as detected estimated (J-) due to low MS %R.

MS/MSD and LCS/LCSD outlier reports can be found in the DVR attachments.

Representativeness – The following QC outliers indicate potential impact on sample representativeness:

- January 2017: Trichloroethene was detected in one trip blank. All trichloroethene results in the associated samples were either non detect or greater than 5X the concentration found in the trip blank, therefore no data were qualified.
- August 2017: Samples were properly preserved and stored in amber containers at 4±2°C with the exception of 1 of the 5 coolers, which had a reported temperature of 12. 7°C upon receipt by the laboratory. Data were qualified as detected estimated (J-) or non-detected estimated (UJ) when the temperature was greater than the upper estimation criteria of 1 0°C.

Field QC sample data can be found in the DVR attachments.

Completeness – The following list represents completeness outliers for the VOC data:

January 2017

- The contract completeness level attained for the field samples was 99.0 percent. Due to quality control exceedances, 9 out of 888 results were qualified as estimated. Percent contract compliance does not consider surrogate outliers or MS/MSD outliers when associated LCS recoveries are in control. (Goal is 100%).

- The analytical completeness level attained for the field samples was 98.9 percent. Due to quality control exceedances, 10 out of 888 results were qualified as estimated. (Goal is 90%). Holding time completeness was 100%.
- The technical completeness, which included all QC parameters, attained for the field samples was 100 percent. No results were rejected.
- The field sampling completeness level attained for the field samples was 100 percent. One hundred eleven out of 111 planned samples were collected.

June 2017

- The contract completeness level attained for the field samples was 100 percent. Due to quality control exceedances, 0 out of 224 results were qualified as estimated. Percent contract compliance does not consider surrogate outliers or MS/MSD outliers when associated LCS recoveries are in control. (Goal is 100%).
- The analytical completeness level attained for the field samples was 100 percent. None of the 224 results were qualified as estimated due to quality control exceedances. (Goal is 90%). Holding time completeness was 100%.
- The technical completeness, which included all QC parameters, attained for the field samples was 100 percent. No results were rejected.
- The field sampling completeness level attained for the field samples was 100 percent. Twenty-eight out of 28 planned samples were collected.

August 2017

- The contract completeness level attained for the field samples was 87.8 percent. Due to quality control exceedances, 88 out of 720 results were qualified as estimated. Percent contract compliance does not consider surrogate outliers or MS/MSD outliers when associated LCS recoveries are in control. (Goal is 100%).
- The analytical completeness level attained for the field samples was 87.8 percent. Due to quality control exceedances, 88 out of 720 results were qualified as estimated. (Goal is 90%). Holding time completeness was 100%.
- The technical completeness, which included all QC parameters, attained for the field samples was 100 percent. No results were rejected.
- The field sampling completeness level attained for the field samples was 100 percent. Ninety out of 90 planned samples were collected.

See the DVRs for full completeness reports of each sampling event.

Sensitivity – The target quantitation limits generally meet QAPP requirements. The following exception was noted:

- Target compounds detected below the limit of quantitation (flagged J by the laboratory) should be considered estimated.

Reporting limit outliers are presented in the DVR attachments.

4 Performance Evaluation Samples

One PE sample (ERA Sample 1) was submitted to the laboratory and analyzed for the purpose of evaluating the accuracy of the performance of the measurement or analytical procedures used by the laboratory. All reported results were acceptable.

5 Data Usability

The overall quality of the data is acceptable. All project DQIs were met with the exception of those noted above. All sample preservation requirements and all holding times were met. All instrument performance checks and calibrations were performed as required. All calibration factors and internal standard percent recoveries were within acceptance criteria. All surrogate, MS/MSD and LCS/LCSD percent recoveries and RPDs were within

acceptance criteria with the exception described in Section 3.2.1. Method blanks, trip blanks, and field blanks were performed at the required frequency. Field duplicates were collected at the required frequency and the precision was considered acceptable. Therefore, all data except those identified above are considered usable with consideration of their data review qualifiers.

6 References

DoD, 2010, Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.0, July 2013.

EPA, 2008, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, USEPA-540-R-08-01, Washington, D.C.

EPA, 2009, Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use, January 2009, EPA 540-R-08-005, Washington, D.C.

Laboratory Data Consultants, Inc., 2006, Automated Data Review, Version 1.5.0.160.

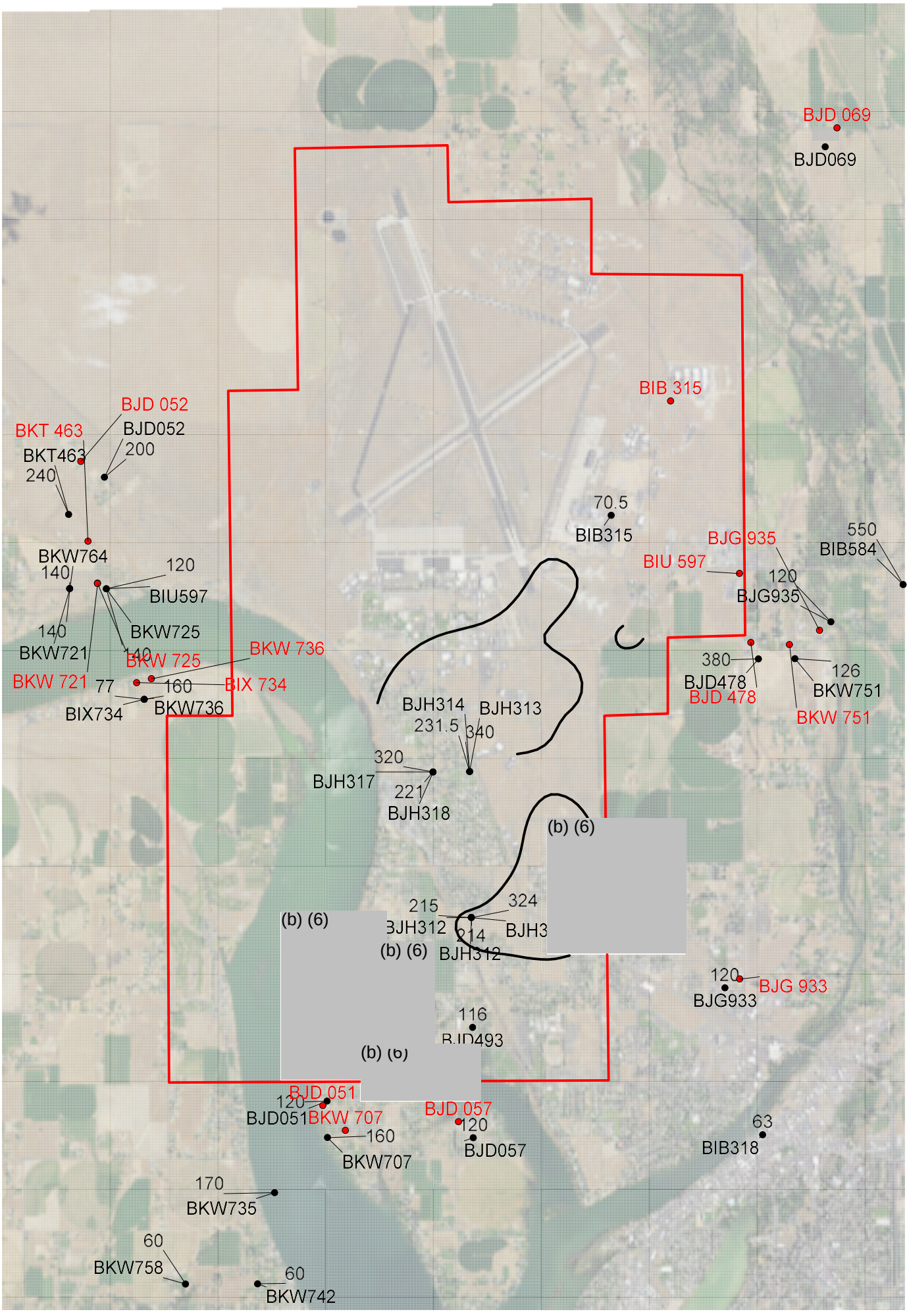
USACE. 2017. Final 2017 Work Plan with Quality Assurance Project Plan. Groundwater Monitoring and Whole-House Filter Program for Moses Lake Wellfield Superfund Site. Former Larson AFB. Moses Lake, Washington. Original November 3, 2016. Final update March 24, 2017.

EPA, 2009, Measurement of Purge able Organic Compounds in Water by Capillary Column Gas Chromatography/Mass Spectrometry: Method 524.3 Version 1, June 2009. USEPA-815-B-09-009. Cincinnati, OH

APPENDIX F – Data Validation Report (CD only)

APPENDIX G – Washington Department of Ecology - New Private Well Query

Ecology Well ID	Address	Within ROD IC Boundary	Recommend Sample?	Depth of well (ft bgs)	Well Completion Date	Notes
BIW971	(b) (6)	No	Yes	118	4/3/2017	The well is located outside of the IC however it is near the south plume.
BKW724		Yes	No	160	5/10/2017	The well is located in Cascade Valley however it is south of the southern edge of the contamination.
BKT480		Yes	No	100	10/18/2017	The well is located in Cascade Valley however it is south of the southern edge of the contamination.
BKT479		Yes	No	100	10/19/2017	The well is located in Cascade Valley however it is south of the southern edge of the contamination.


BJD 069
BJD069
BIB 315
BJD 052
BKT 463
BJD052
200
BKT463
240
BKW764
140
120
BIU597
140
BKW721
BKW725
140
BKW 736
BKW 725
BKW 721
77
160
BIX 734
BIX734
BKW736
70.5
BIB315
BJG 935
BIU 597
550
BIB584
120
BJG935
380
BJD478
BJD 478
126
BKW751
BKW 751
BJH314
231.5
BJH313
340
320
BJH317
221
BJH318
(b) (6)
(b) (6)
215
324
BJH312
214
BJH3
(b) (6)
BJH312
120
BJG933
BJG 933
116
BJD493
(b) (6)
BJD 051
120
BJD051
BKW 707
160
BKW707
BJD 057
120
BJD057
63
BIB318
170
BKW735
60
BKW758
60
BKW742

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ☐ Domestic ☐ Industrial ☒ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well **20** inches, drilled **70.5** ft. Depth of completed well **72** ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded **20"** Diam. from **+1.5** ft. to **37.5** ft.

☐ Liner installed _____" Diam. from _____ ft. to _____ ft.

☐ Threaded _____" Diam. From _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No

Type of perforator used _____

SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☒ Yes ☐ No ☐ K-Pac Location _____

Manufacturer's Name **Alloy Machine Works**

Type **S.S** Model No. **Pipe Size**

Diam. **18"** Slot size **.100** from **39.2** ft. to **60.4** ft.

Diam. **18"** Slot size **sump** from **60.4** ft. to **70.5** ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? **18**ft.

Material used in seal **Bentonite Chips**

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level **35.9** ft. below top of well Date **3-31-16**

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☒ Yes ☐ No If yes, by whom? **TP@D**

Yield: **1020** gal./min. with **.42** ft. drawdown after **2.5** hrs.

Yield: **1515** gal./min. with **1.35** ft. drawdown after **3** hrs.

Yield: **1930** gal./min. with **2** ft. drawdown after **2** hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
1min	**38.53**				

Date of test **6-9-16**

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water **58** Was a chemical analysis made? ☒ Yes ☐ No

CURRENT

Notice of Intent No. **WE23419**

Unique Ecology Well ID Tag No. **BIB 315**

Water Right Permit No. _____

Property Owner Name **City Of Moses Lake**

Well Street Address **8213 Randolph Rd NE**

City Moses Lake County Grant

Location NW1/4-1/4 **SW**1/4 Sec **27** Twn **20n** R **28** **EWM** ☒ **Or** **WWM** ☐

(s, t, r Still REQUIRED)

Lat/Long

Lat Deg _____ Lat Min/Sec _____

Long Deg _____ Long Min/Sec _____

Tax parcel No. (Required) **12-0682-301**

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Fine silty topsoil.	**0**	**1**
Course gravels and cobbles.	**1**	**8**
Grey brown clayey course gravel, cobbles.	**8**	**21**
Boulder	**21**	**24**
Medium to course gravel, cobbles.	**24**	**41**
Looser medium to course sand and gravels,	**41**	**50**
some visicular basalt gravel with light brown		
silt.		
Wet medium to course gravel, cobbles.	**50**	**57**
Grey brown weathered basalt.	**57**	**63**
Fractured grey basalt, oxidized	**63**	**70.5**

RECEIVED

JUN 20 2016

Department of Ecology
Eastern Washington Office

Start Date **3-22-16** Completed Date **4-7-16**

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) **MattCall**

Driller/Engineer/Trainee Signature

Driller or trainee License No. **2467**

IF TRAINEE: Driller's License No:

Driller's Signature: Matt Call

Drilling Company **Tacoma Pump @ Drilling**

Address **30316 Mountain Hwy**

City, State, Zip **Graham** , **Wa. 98338**

Contractor's Registration No. **TACOMPD203PF** Date **6-16-16**

ECY 050-1-20 (Rev 02-2010) To request ADA accommodation including materials in a format for the visually impaired, call Ecology Water Resources Program at 360-407-6872. Persons with impaired hearing may call Washington Relay Service at 711. Persons with speech disability may call TTY at 877-833-6341.

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ☐ Domestic ☐ Industrial ☒ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☐ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☐ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 12 inches, drilled 550 ft. Depth of completed well 550 ft.

CONSTRUCTION DETAILS

Casing ☒ Welded 12 " Diam. from +1 ft. to 20 ft.

Installed: ☐ Liner installed 8 " Diam. from +2 ft. to 410 ft.

☐ Threaded _____ " Diam. From _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No

Type of perforator used _____

SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 20 ft.

Material used in seal BENTONITE CHIPS

Did any strata contain unusable water? ☐ Yes ☐ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 191 ft. below top of well Date 10/8/15

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☒ Yes ☐ No If yes, by whom? TP & D

Yield: 300 gal./min. with 139 ft. drawdown after 8 hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 240 gal./min. with stem set at 500 ft. for 1 hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☐ No

CURRENT

Notice of Intent No. WE21911

Unique Ecology Well ID Tag No. BIB 584

Water Right Permit No. _____

Property Owner Name WASHINGTON DEPT. OF FISH & WILDLIFE

Well Street Address 6653 NE ROAD K

City MOSES LAKE County GRANT

Location NW 1/4-1/4 NW 1/4 Sec 36 Twn 20N R 28E EWM ☐ Or WWM ☐

(s, t, r Still REQUIRED)

Lat/Long

Lat Deg _____ Lat Min/Sec _____

Long Deg _____ Long Min/Sec _____

Tax parcel No. (Required) 17106100

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
SEE ATTACHED SHEET		

RECEIVED

FEB 29 2016

Department of Ecology
Eastern Washington Office

JOB #15-1777-08

Start Date 9/15/15 Completed Date 2/5/2016

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name JACOB HANSEN

Driller/Engineer/Trainee Signature _____

Driller or trainee License No. 3180

IF TRAINEE: Driller's License No:

Driller's Signature:

Drilling Company TACOMA PUMP & DRILLING CO., INC.

Address 30316 MOUNTAIN HIGHWAY

City, State, Zip GRAHAM, WA 98338

Contractor's Registration No. TACOMPD203PT Date 2-25-16

ECY 050-1-20 (Rev 02-2010) To request ADA accommodation including materials in a format for the visually impaired, call Ecology Water Resources Program at 360-407-6872. Persons with impaired hearing may call Washington Relay Service at 711. Persons with speech disability may call TTY at 877-833-6341.

From	To	Formation
0	6	Brown silty sand and gravels
6	15	Brown weathered Basalt
15	33	Competent Grey Basalt
33	41	Fractured Grey Basalt
41	66	Weathered Brown/Tan Basalt
66	75	Competent Grey Basalt
75	87	Vesiculated Grey Basalt
87	95	Grey Vesiculated Basalt w/ some quartz like mineral
95	115	Grey Hard/Competent Basalt. Vesiculated with quartz like mineral w/ blue mineral deposit
115	117	Tan weather basalt
117	147	Grey Competent Basalt
147	160	Fractured Black Basalt w/ Baked Green Claystone
160	165	Brown Basalt
165	226	Competent Grey Basalt
226	227	Fracture Grey Basalt w/ h20- 20gpm
227	234	Vesiculated Grey Basalt
234	280	Vesiculated Grey Basalt w/ soft green claystone
280	283	Grey Vesiculated Basalt. H20 50 pgm
283	304	Grey Dense Basalt w/ green claystone
304	320	Grey Dense Basalt
320	338	Black Vesiculated w/ Green Claystone
338	340	Vesiculated Grey Basalt w/ very soft green and orange
340	353	Hard/competent Grey Basalt
353	363	Black vesiculated w/ green/blue baked claystone extremely soft
363	366	Grey Dense Basalt
366	378	Grey Balalt with green claystone, some quartz like mineral
378	382	Very Hard/ Fractured Grey Basalt
382	388	Black Vesiculated w/ Green Claystone
388	406	Competent Grey/Green Basalt
406	457	competent soft grey basalt some quartz like mineral
457	463	Fractured Grey basalt
463	465	Competent Grey Basalt
465	485	Grey Vesiculated Basalt w/ some green/red weathering some H20
485	487	Competent Grey Basalt
487	491	Very soft Baked Green Claystone
491	497	Soft Vesiculated Grey Basalt
497	501	Very Hard Dense Basalt
501	510	Hard Fracture Grey Basalt No Water
510	524	Med Hard Grey Basalt
524	550	Soft Grey Basalt w/ some Green Jointing-substantial increase in H20 Production

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission ("x" in circle)

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 120 ft. Depth of completed well 118 ft.

CONSTRUCTION DETAILS

Casing ☒ Welded 6" Diam. from +2 ft. to 110 ft.

Installed: ☐ Liner installed _____" Diam. from _____ ft. to _____ ft.

☐ Threaded _____" Diam. From _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No

Type of perforator used _____

SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.

Material used in seal Dry Bentonite

Did any strata contain unusable water? ☒ Yes ☐ No

Type of water? Surface Depth of strata 24'–57'

Method of sealing strata off Cased off

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 25 ft. below top of well Date 2/4/16

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 60+ gal./min. with stem set at 118 ft. for 2 hrs.

Artesian flow _____ g.p.m. Date 2/4/16

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CURRENT

Notice of Intent No. W362413

Unique Ecology Well ID Tag No. BIU-597

Water Right Permit No. NO

Property Owner Name (b) (6)

Well Street Address _____

City Moses Lake County Grant

Location NW 1/4-1/4 NE 1/4 Sec 36 Twn 20 R 27 EWM ☒ Or WWM ☐

(s, t, r Still REQUIRED)

Lat/Long Lat Deg ____ Lat Min/Sec ____

Long Deg ____ Long Min/Sec ____

Tax Parcel No. (Required) 120724116

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Topsoil	0	1'
Black Sand	1'	6'
Gravel & Black Sand	6'	10'
Gravel	10'	24'
Brown Sand & Clay H2O	24'	45'
Brown Fractured Basalt & H2O	45'	57'
Tan Sand & Clay	57'	71'
Tan Clay	71'	80'
Gray Clay	80'	107'
Brown Basalt & H2O	107'	116'
Fractured Caving Basalt & H2O	116'	120'

RECEIVED

APR 28 2016

Department of Ecology
Eastern Regional Office

Start Date 2/4/16 Completed Date 2/4/16

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (print) D Cole

Driller/Engineer/Trainee Signature D Cole

Driller or trainee License No. 3165

IF TRAINEE: Driller's License No:

Driller's Signature:

Drilling Company D C Drilling Inc

Address PO Box 1269

City, State, Zip Royal City WA 99357

Contractor's Registration No. DCDRICD875QF Date 2/4/16

ECY 050-1-20 (Rev 02/10) *If you need this document in an alternate format, please call the Water Resources Program at 360-407-6872. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.*

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 118 ft. Depth of completed well 118 ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 6" Diam. from +2 ft. to 83.5 ft.

☒ Liner installed 4 1/2" Diam. from -78 ft. to 118 ft.

☐ Threaded _____" Diam. From _____ ft. to _____ ft.

Perforations: ☒ Yes ☐ No

Type of perforator used Saw cut

SIZE of perfs 1/8 in. by 8 in. and no. of perfs 42 from 98 ft. to 118 ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.

Material used in seal Bentonite

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level 1109 ft.

Static level 61 ft. below top of well Date 04-03-17

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 40+ gal./min. with stem set at 117 ft. for 1 hrs.

Artesian flow _____ g.p.m. Date 04-03-17

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CURRENT

Notice of Intent No. WE 27219

Unique Ecology Well ID Tag No. BIW 971

Water Right Permit No. _____

Property Owner Name (b) (6)

Well Street Address (b) (6)

City Moses Lake County Grant

Location NW1/4-1/4 NW1/4 Sec 10 Twn 19 R 28 (s, t, r **Still REQUIRED**) EWM ☒ Or WWM ☐

Lat/Long Lat Deg N 47 Lat Min/Sec 09'28.04

Long Deg W 119 Long Min/Sec 17'47.08

Tax Parcel No. (Required) 120369000

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Brown clay, cobbles	0	8
Black sand	8	14
Black broken basalt, sand	14	49
Tan calichee	49	52
Dk. brown clay	52	79
White clay	79	81
Brown basalt, broken basalt	81	83
Black hard basalt	83	86
Brown basalt w/ fractured zones WB @ 103-108	86	113
Brown basalt	113	118

RECEIVED
MAY 01 2017
Dept of Ecology
Central Regional Office

MAY 12 2017

Start Date 04-03-17 Completed Date 04-03-17

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Brett Phythian

Driller/Engineer/Trainee Signature

Driller or trainee License No. 1249

IF TRAINEE: Driller's License No.

Driller's Signature:

Drilling Company Tumwater Drilling & Pump Inc.

Address P O Box 249 / 9290 Hwy 2

City, State, Zip Dryden , WA, 98821

Contractor's Registration No. TUWADP943RR Date 04-04-2017

ECY 050-1-20 (Rev 02/10) *If you need this document in an alternate format, please call the Water Resources Program at 360-407-6872. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.*

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

WATER WELL REPORT

State of Washington Date Printed: 18-May-2016 Log No. 0

Construction / Decommission: Original Construction Notice

Construction

PROPOSED USE: **DOMESTIC**

TYPE OF WORK: Owners's Well Number: (If more than one well) 1

NEW Method: **ROTARY**

DIMENSIONS: Diameter of well: **6** inches

Drilled **80** ft. Depth of completed well **77** ft.

CONSTRUCTION DETAILS:

Liner installed:

" Dia from ft. to ft.

Casing installed **WELDED**

6 " Dia from **+3** ft. to **77** ft.

" Dia from ft. to ft.

" Dia from ft. to ft.

Perforations: **No** Used In:

Type of perforator used

SIZE of perforations in. by in.

Perforations from ft. to ft.

Perforations from ft. to ft.

Perforations from ft. to ft.

Screens: **0** K-Pac Location:

Manufacture's Name

Type: Model No

Diam. slot size: from ft. to ft.

Diam. slot size: from ft. to ft.

Gravel/Filter packed: **No** Size of Gravel

Material placed fro ft. to ft.

Surface seal: **Yes** To what depth **77** ft.

Seal method: Material used in seal **BENT & CASING**

Did any strata contain unusable water **No**

Type of water Depth of strata

Method of sealing strata off

PUMP: Manufacture's name

Type: H.P. **0**

WATER LEVELS Land-surface elevation above mean sea level: **0** ft.

Static level **47** ft. below top of well Date **04/27/2016**

Artesian Pressure lbs per square inch Date

Artesian water controlled by

WELL TESTS: Drawdown is amount water level is lowered below static level.

Was a pump test made **No** If yes, by whom

Yield: gal/min with ft drawdown after

Yield: gal/min with ft drawdown after

Yield: gal/min with ft drawdown after

Recovery data (time taken as zero when pump turned off)(water level measured from well top to water level

Time:	Water Level	Time:	Water Level	Time:	Water Level

Date of test:

Bailer test gal/min ft drawdown after hrs.

Air test **20** gal/min w/ stem set at **75** ft. for **1** hours

Artesian flow gpm Date

Temperature of water Was a chemical analysis made **No**

CURRENT

Notice of Intent No.: **WE23318**

Unique Ecology Well I.D. No **BIX734**

Water Right Permit Number:

OWNER: (b) (6)

OWNER ADD

SUN CITY, AZ 85351

Well Add **5810 E PANORAMA DR**

City: **Moses Lake, WA 98837** County: **Grant**

Location: **SE** 1/4 **SE** 1/4 Sec **36** T **20** R **27E** EW

Lat/Long: (s, t, r still REQUIRED) Lat Deg Lat Min/Sec

Long Deg Long Min/Se

Tax Parcel No.: **311755000**

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure. Show thickness of aquifers and the kind and nature of the material in each stratum penetrated. Show at least one entry for each change in formation.

Material	From	To
LOAM BOULDERS	0	5
GRAVEL COBBLES BOULDERS	5	14
BASALT GRAVEL BLACK	14	52
GRAVEL CLAY BROWN	52	57
CLAY BROWN	57	74
GRAVEL CLAY BROWN WET	74	80

RECEIVED

JUL 29 2016

Notes: Department of Ecology Eastern Regional Office

Work starte **04/26/2016** Complete **04/27/2016**

WELL CONSTRUCTION CERTIFICATION:

I constructed and/or accept responsibility for construction of this well and its compliance with all Washington well construction standards. Materials used and the information reported are true to my best knowledge and belief.

☑ Driller ☐ Engineer ☐ Trainee

Name: **AUDIE MCCURDY** License No.: **2690**

Signature: Audie McCurdy

If trainee, Licensed driller is: License No.:

Licensed Driller Signature

Drilling Company:

NAME: **FOGLE PUMP & SUPPLY, INC.** Shop: **AIRWAY HEI**

ADDRESS: **PO BOX 1450**

Airway Heights, WA 99001

Phone: **(509) 244-0846** Toll Free: **(888) 343-9355**

E-Mail: **marty@foglepump.com**

FAX: **(509) 244-2875** WEB Site: **WWW.FOGLEPUMP.COM**

Contractor's Registration No.: **FOGLEPS095L4** Date Log Created: **5/18/2016**

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

CURRENT

Notice of Intent No. W 362416

Unique Ecology Well ID Tag No. BJD 051

Water Right Permit No. No

Property Owner Name (b) (6)

Well Street Address _____

City Moses Lake County Grant

Location NW 1/4-1/4 SW 1/4 Sec 17 Twn 19 R 28 (s, t, r Still REQUIRED) EWM ☒ Or WWM ☐

Lat/Long Lat Deg ____ Lat Min/Sec ____ Long Deg ____ Long Min/Sec ____

Tax Parcel No. (Required) T21126409

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 120 ft. Depth of completed well 120 ft.

CONSTRUCTION DETAILS

Casing ☒ Welded 6 " Diam. from +2 ft. to 78 ft.

Installed: ☒ Liner installed 4 " Diam. from −20 ft. to 120 ft.

☐ Threaded _____ " Diam. From _____ ft. to _____ ft.

Perforations: ☒ Yes ☐ No

Type of perforator used Saw Cut

SIZE of perfs 1/4 in. by 7 in. and no. of perfs 90 from 80 ft. to 120 ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.

Material used in seal Dry Bentonite

Did any strata contain unusable water? ☒ Yes ☐ No

Type of water? Surface Depth of strata 15'–61'

Method of sealing strata off Cased

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 20 ft. below top of well Date 2/26/16

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 60+ gal./min. with stem set at 118 ft. for 2 hrs.

Artesian flow _____ g.p.m. Date 2/26/16

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Top Soil	0	1'
Gravel & Cobbles	1'	12'
Gravel	12'	15'
Gravel & H2O	15'	60'
Tan Clay Gravel & H2O	60'	61'
Sticky Tan Clay Dry	61'	74'
Brown Clay	74'	77'
Brown Clay & Basalt	77'	79'
Brown Basalt Little H2O 7 gpm	79'	91'
Hard Gray Basalt	91'	108'
Brown Fractured Basalt Lots of H2O	108'	120'

RECEIVED

APR 28 2016

Department of Ecology
Eastern Regional Office

Start Date 2/26/16 Completed Date 2/26/16

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Cole

Driller/Engineer/Trainee Signature _____

Driller or trainee License No. 3165

IF TRAINEE: Driller's License No:

Driller's Signature:

Drilling Company D C Drilling Inc

Address PO Box 1269

City, State, Zip Royal City WA 99357

Contractor's Registration No. DCDRIC987SOF Date 2/26/16

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

CURRENT

Notice of Intent No. W362418

Unique Ecology Well ID Tag No. BJN 052

Water Right Permit No. NO

Property Owner Name (b) (6)

Well Street Address _____

City Moses Lake County Grant

Location SW 1/4-1/4 NE 1/4 Sec 25 Twn 20 R 27 (s, t, r Still REQUIRED) EWM ☒ Or WWM ☐

Lat/Long Lat Deg ____ Lat Min/Sec ____ Long Deg ____ Long Min/Sec ____

Tax Parcel No. (Required) 313235000

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 200 ft. Depth of completed well 200 ft.

CONSTRUCTION DETAILS

Casing ☒ Welded 6" Diam. from +2 ft. to 198 ft.

Installed: ☐ Liner installed ____" Diam. from ____ ft. to ____ ft.

☐ Threaded ____" Diam. From ____ ft. to ____ ft.

Perforations: ☒ Yes ☐ No

Type of perforator used Mill Knife

SIZE of perfs 3/8 in. by 3 in. and no. of perfs 30 from 188 ft. to 195 ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.

Material used in seal Dry Bentonite

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 152 ft. below top of well Date 3/18/16

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 30 gal./min. with stem set at 198 ft. for 2 hrs.

Artesian flow _____ g.p.m. Date 3/19/16

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Top Soil	0'	1'
Gravel & Black Sand	1'	8'
Gravel	8'	16'
Brown Clay & gravel	16'	164'
Brown Clay	164'	187'
Gravel & H_2O	187'	195'
Brown Clay	195'	200'

RECEIVED

APR 28 2016

Department of Ecology
Eastern Regional Office

Start Date 3/18/16 Completed Date 3/18/16

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) D. Cole

Driller/Engineer/Trainee Signature D. Cole

Driller or trainee License No. 3165

IF TRAINEE: Driller's License No:

Driller's Signature:

Drilling Company D C Drilling Inc

Address PO Box 1269

City, State, Zip Royal City WA 99357

Contractor's Registration No. DCDRICD875OF Date 3/18/16

ECY 050-1-20 (Rev 02/10) *If you need this document in an alternate format, please call the Water Resources Program at 360-407-6872. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.*

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 120 ft. Depth of completed well 120 ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 6" Diam. from +2 ft. to 93' ft.

☐ Liner installed _____" Diam. from _____ ft. to _____ ft.

☐ Threaded _____" Diam. From _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No

Type of perforator used _____

SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.

Material used in seal Drm Bentonite

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 22 ft. below top of well Date 4/8/16

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 60+ gal./min. with stem set at 118 ft. for 2 hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CURRENT

Notice of Intent No. W362426

Unique Ecology Well ID Tag No. BJD 057

Water Right Permit No. No

Property Owner Name (b) (6)

Well Street Address _____

City Moses Lake County Grant

Location SW 1/4-1/4 SW 1/4 Sec 16 Twn 19 R 28 EWM ☒ Or WWM ☐

(s, t, r Still REQUIRED)

Lat/Long Lat Deg ____ Lat Min/Sec ____ Long Deg ____ Long Min/Sec ____

Tax Parcel No. (Required) 311379000

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Top Soil	0'	1'
Gravel	1'	34'
Brown Clay	34'	72'
Gray Clay	72'	90'
Brown Clay	90'	93'
Brown Clay & Brown Basalt	93'	98'
Brown Basalt & H2O	98'	120'

RECEIVED

APR 28 2016

Department of Ecology
Eastern Regional Office

Start Date 4/8/16 Completed Date 4/8/16

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Cole

Driller/Engineer/Trainee Signature D. Cole

Driller or trainee License No. 3165

IF TRAINEE: Driller's License No:

Driller's Signature:

Drilling Company DC Drilling Inc

Address PO Box 1269

City, State, Zip Royal City WA 99357

Contractor's Registration No. DCDRIC*875OF Date 4/8/16

ECY 050-1-20 (Rev 02/10) *If you need this document in an alternate format, please call the Water Resources Program at 360-407-6872. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.*

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

CURRENT

Notice of Intent No. W248996

Unique Ecology Well ID Tag No. BJD069

Water Right Permit No. Exempt

Property Owner Name (b) (6)

Well Street Address _____

City Moses Lake County Grant

Location NW 1/4-1/4 NE 1/4 Sec 14 Twn 20 R 28 (s, t, r Still REQUIRED) EWM ☒ Or WWM ☐

Lat/Long Lat Deg ____ Lat Min/Sec ____ Long Deg ____ Long Min/Sec ____

Tax Parcel No. (Required) 170929000

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 100 ft. Depth of completed well 100 ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 6" Diam. from +2 ft. to 38 ft.

☒ Liner installed 4" Diam. from -20 ft. to 100 ft.

☐ Threaded _____" Diam. From _____ ft. to _____ ft.

Perforations: ☒ Yes ☐ No

Type of perforator used Saw Cut

SIZE of perfs ¼ in. by 7 in. and no. of perfs 90 from 60 ft. to 100 ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.

Material used in seal Dry Bentonite

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 35 ft. below top of well Date 6/19/16

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 25 gal./min. with stem set at 98 ft. for 2 hrs.

Artesian flow _____ g.p.m. Date 6/19/16

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Topsoil	0'	1'
Cobbles & Gravel	1'	23'
Cleachy Rock	23'	27'
Brown Basalt Soft		
With Brown Clay	27'	42'
& Brown Sandstone	42'	48'
Brown Basalt Little		
H2O	48'	57'
Brown Basalt Soft		
With 10 gpm	57'	63'
Brown Basalt With		
gray Seams H2O 5gpm	63'	80'
Fractured Brown		
Basalt With Whiteclay		
& H2O 10 gpm	80'	95'
Hard Gray Basalt	95'	100'

RECEIVED

AUG 01 2016

Department of Ecology
Eastern Regional Office

Start Date 6/19/16 Completed Date 6/19/16

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Cole

Driller/Engineer/Trainee Signature _____

Driller or trainee License No. 3165

IF TRAINEE: Driller's License No:

Driller's Signature:

Drilling Company DC DRILLING INC.

Address P.O. BOX 1269

City, State, Zip ROYAL CITY. • WA 99357

Contractor's Registration No. DCDRIC*875OF Date 6/19/16

ECY 050-1-20 (Rev 02/10) *If you need this document in an alternate format, please call the Water Resources Program at 360-407-6872. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.*

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 380 ft. Depth of completed well 380 ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 6" Diam. from +2 ft. to 18 ft.

☒ Liner installed 4" Diam. from -16 ft. to 380 ft.

☐ Threaded _____" Diam. From _____ ft. to _____ ft.

Perforations: ☒ Yes ☐ No

Type of perforator used Saw cut

SIZE of perfs 8 in. by 1/4 in. and no. of perfs 200 from 380 ft. to 280 ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.

Material used in seal Bentonite

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level 0 ft.

Static level 90 ft. below top of well Date 8-30-16

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 75 gal./min. with stem set at 380 ft. for 1 hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CURRENT

Notice of Intent No. WE 23192

Unique Ecology Well ID Tag No. BJD 478

Water Right Permit No.

Property Owner Name (b) (6) [redacted]

Well Street Address _____

City Moses Lake County Grant

Location SW/4-1/4 NW/4 Sec 35 Twn 20 R 28 EWM ☒ Or WWM ☐

(s, t, r Still REQUIRED)

Lat/Long Lat Deg ____ Lat Min/Sec ____

Long Deg ____ Long Min/Sec ____

Tax Parcel No. (Required) 121612000

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Dirt	0	8
Gravel / Dirt	8	15
Basalt Brown	15	21
Black Basalt	21	85
Broken Brown / (H20)	85	95
Black Basalt	95	355
Broken Black / (H20)	355	375
Black Basalt	375	380

RECEIVED

SEP 23 2016

Department of Ecology
Eastern Washington Office

Start Date 8-27-16 Completed Date 8-30-16

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Kevin Boyd

Driller/Engineer/Trainee Signature _____

Driller or trainee License No. 2996

IF TRAINEE: Driller's License No: _____

Driller's Signature: _____

Drilling Company Empire Well Drilling Inc

Address P.O. Box 3854

City, State, Zip Wenatchee WA [redacted]7880

Contractor's Registration No. EMPIR876MN Date 9-30-16

ECY 050-1-20 (Rev 02/10) *If you need this document in an alternate format, please call the Water Resources Program at 360-407-6872. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.*

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 116 ft. Depth of completed well 116 ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 6" Diam. from +2 ft. to 85 ft.

☐ Liner installed _____" Diam. from _____ ft. to _____ ft.

☐ Threaded _____" Diam. From _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No

Type of perforator used _____

SIZE of perfs ____ in. by ____ in. and no. of perfs ____ from ____ ft. to ____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.

Material used in seal Bentonite

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level 0 ft.

Static level 50 ft. below top of well Date 4-22-16

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 30 gal./min. with stem set at 116 ft. for 1 hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CURRENT

Notice of Intent No. WE23191

Unique Ecology Well ID Tag No. BSD 493

Water Right Permit No. _____

Property Owner Name (b) (6) [redacted]

Well Street Address _____

City Moses Lake County Grant

Location NW 1/4-1/4 NW 1/4 Sec 16 Twn 19 R 28 EWM ☒ Or WWM ☐

(s, t, r Still REQUIRED)

Lat/Long Lat Deg ____ Lat Min/Sec ____

Long Deg ____ Long Min/Sec ____

Tax Parcel No. (Required) 171116000

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Silt / Dirt	0	5
Sand	5	20
Gravel	20	35
Brown Clay	35	80
Sandstone	80	85
Basalt	85	95
Broken Basalt (H2O)	95	116

RECEIVED

MAY 05 2016

Department of Ecology
Eastern Washington Office

Start Date 4-22-16 Completed Date 4-22-16

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Lewis Boyd

Driller/Engineer/Trainee Signature _____

Driller or trainee License No. 2996

IF TRAINEE: Driller's License No: David Rodeman

Driller's Signature: _____

Drilling Company Empire Well Drilling LLC

Address P.O. Box 3854

City, State, Zip Wenatchee, WA. 98807

Contractor's Registration No. EMPIRWD876MN Date 4-22-16

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 120 ft. Depth of completed well 120 ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 6" Diam. from +2 ft. to 74 ft.

☐ Liner installed _____" Diam. from _____ ft. to _____ ft.

☐ Threaded _____" Diam. From _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No

Type of perforator used _____

SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.

Material used in seal Dry Bentonite

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 41 ft. below top of well Date 8/4/16

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 30 gal./min. with stem set at 118 ft. for 2 hrs.

Artesian flow _____ g.p.m. Date 8/4/16

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CURRENT

Notice of Intent No. W362446

Unique Ecology Well ID Tag No. BJG 933

Water Right Permit No. Exempt

Property Owner Name (b) (6)

Well Street Address _____

City Moses Lake County Grant

Location SE 1/4-1/4 SE 1/4 Sec 10 Twn 19 R 28 (s, t, r Still REQUIRED) EWM ☒ Or WWM ☐

Lat/Long Lat Deg ____ Lat Min/Sec ____ Long Deg ____ Long Min/Sec ____

Tax Parcel No. (Required) 170409000

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
TopSoil	0	1'
Gravel Sand Clay	1'	5'
Gravel	5'	51'
Gravel & Brown Clay	51'	63'
Tan Dry Clay	63'	74'
Brown Basalt & Brown Clay	74'	85'
Hard Gray Basalt	85'	96'
Brown Basalt H2O 5gpm	96'	99'
Hard Gray Basalt	99'	108'
Black Basalt Soft H2O	108'	116'
Hard Gray Basalt	116'	120'

RECEIVED

OCT 26 2016

Department of Ecology
Eastern Washington Office

Start Date 8/4/16 Completed Date 8/4/16

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Cole

Driller/Engineer/Trainee Signature D. Cole

Driller or trainee License No. 3165

IF TRAINEE: Driller's License No:

Driller's Signature:

DC DRILLING INC.

Drilling Company

P.O. BOX 1269

Address

ROYAL CITY • WA 99357

City, State, Zip

Contractor's Registration No. DCDRIC0875QF Date 8/14/16

ECY 050-1-20 (Rev 02/10) *If you need this document in an alternate format, please call the Water Resources Program at 360-407-6872. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.*

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 120 ft. Depth of completed well 120 ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 6 " Diam. from +2 ft. to 58 ft.

☐ Liner installed _____ " Diam. from _____ ft. to _____ ft.

☐ Threaded _____ " Diam. From _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No

Type of perforator used _____

SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 58 ft.

Material used in seal Cement

Did any strata contain unusable water? ☒ Yes ☐ No

Type of water? Surface Depth of strata 5'–28'

Method of sealing strata off Cased & Cement

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level _____ ft. below top of well Date _____

Artesian pressure ½ lbs. per square inch Date 8/16/16

Artesian water is controlled by Cap (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 60+ gal./min. with stem set at 118 ft. for 2 hrs.

Artesian flow 1–2 g.p.m. Date 8/16/16

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CURRENT

Notice of Intent No. W362448

Unique Ecology Well ID Tag No. BJG935

Water Right Permit No. Exempt

Property Owner Name (b) (6)

Well Street Address _____

City Moses Lake County Grant

Location SW 1/4-1/4 NE 1/4 Sec 35 Twn 20 R 28 (s, t, r Still REQUIRED) EWM ☒ Or WWM ☐

Lat/Long Lat Deg ____ Lat Min/Sec ____

Long Deg ____ Long Min/Sec ____

Tax Parcel No. (Required) 121960003

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
TOPSoil	0'	1'
Gravel H2O at 5'	1'	7'
Brown Basalt & H2O	7'	24'
Black Basalt Soft H2O	24'	28'
Hard Gray Basalt	28'	42'
Black Basalt Soft to medium	42'	47'
Hard Gray Basalt	47'	62'
Black Basalt medium Hard	62'	84'
Hard Gray Basalt	84'	91'
Black Basalt Soft medium	91'	96'
Brown Basalt Soft H2O	96'	105'
Black Basalt Soft H2O	105'	116'
Hard Gray Basalt	116'	120'

RECEIVED

OCT 26 2016

Department of Ecology
Eastern Washington Office

Start Date 8/12/16 Completed Date 8/16/16

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Cole

Driller/Engineer/Trainee Signature D. Cole

Driller or trainee License No. 3165

IF TRAINEE: Driller's License No:

Driller's Signature:

DC DRILLING INC.

Drilling Company

Address P.O. BOX 1269

City, State, Zip ROYAL CITY • WA 99357

Contractor's Registration No. DCDRIC087505 Date 8/16/16

ECY 050-1-20 (Rev 02/10) *If you need this document in an alternate format, please call the Water Resources Program at 360-407-6872. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.*

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☐ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 240 ft. Depth of completed well 240 ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 6 " Diam. from 0 ft. to 180 ft.
☐ Liner installed _____ " Diam. from _____ ft. to _____ ft.
☐ Threaded _____ " Diam. From _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No

Type of perforator used _____

SIZE of perfs ____ in. by ____ in. and no. of perfs ____ from ____ ft. to ____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 20 ft.

Material used in seal Bentonite

Did any strata contain unusable water? ☐ Yes ☐ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 90 ft. below top of well Date 4-27-17

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☐ No If yes, by whom? _____

Yield: _____ gal./min. with ____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with ____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with ____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with ____ ft. drawdown after ____ hrs.

Airtest 30 gal./min. with stem set at 220 ft. for 2 hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☐ No

CURRENT

Notice of Intent No. WE 27430

Unique Ecology Well ID Tag No. BKT- 463

Water Right Permit No. _____

Property Owner Name (b) (6)

Well Street Address NKA

City Moses Lake County Grant

Location NE 1/4-1/4 SW 1/4 Sec 25 Twn 20 R 27 (s, t, r Still REQUIRED) EWM ☐ Or WWM ☐

Lat/Long Lat Deg ____ Lat Min/Sec ____ Long Deg ____ Long Min/Sec ____

Tax Parcel No. (Required) 121938339

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Topsoil	0	1
Boulders	1	10
Gravel	10	60
Clay w/ gravel	60	110
Gray Clay	110	176
Black Basalt	176	230
Brown Soft Basalt	230	240

MAY 21 2017

MAY 12 2017

Start Date 4/26 Completed Date 4/27

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Salvador Valenciano

Driller/Engineer/Trainee Signature _____

Driller or trainee License No. 2986

IF TRAINEE: Driller's License No:

Driller's Signature: Salvador V. B.

Drilling Company Bransen Drilling

Address 406 W Broadway, Suite F

City, State, Zip Moses Lake, WA, 98837

Contractor's Registration No. BRANSDL984NS Date 5-8-17

ECY 050-1-20 (Rev 02/10) *If you need this document in an alternate format, please call the Water Resources Program at 360-407-6872. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.*

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

■ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ■ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

■ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☐ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 8 inches, drilled 100 ft. Depth of completed well 100 ft.

CONSTRUCTION DETAILS

Casing Installed: ■ Welded 8 " Diam. from 0 ft. to 80 ft. ☐ Liner installed _____ " Diam. from _____ ft. to _____ ft. ☐ Threaded _____ " Diam. From _____ ft. to _____ ft.

Perforations: ☐ Yes ■ No

Type of perforator used **Skill Saw**

SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ■ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ■ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ■ Yes ☐ No To what depth? 20 ft.

Material used in seal **Bentonite**

Did any strata contain unusable water? ☐ Yes ■ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 25 ft. below top of well Date **10-19-17**

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☐ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 50 gal./min. with stem set at 80 ft. for 1 hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? ☐ Yes ■ No

CURRENT

Notice of Intent No. **WE29012**

Unique Ecology Well ID Tag No. **BKT-479**

Water Right Permit No. _____

Property Owner Name (b) (6)

Well Street Address (b) (6)

City **Moses Lake** County **Grant**

Location SW 1/4-1/4 NE 1/4 Sec 17 Twn 19N R 28E (s, t, r Still REQUIRED) EWM ■ Or WWM ☐

Lat/Long

Lat Deg _____ Lat Min/Sec _____

Long Deg _____ Long Min/Sec _____

Tax parcel No. (Required) **170670000**

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Top Soil	**0**	**5**
Gravel	**5**	**70**
Brown Basalt	**70**	**100**

RECEIVED

NOV 09 2017

Department of Ecology
Eastern Washington Office

Start Date **10-18-17** Completed Date **10-19-17**

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

■ Driller ☐ Engineer ☐ Trainee Name Salvador Valenciano

Driller/Engineer/Trainee Signature

Driller or trainee License No. **2986**

IF TRAINEE: Driller's License No:

Driller's Signature: Salvador V. B.

Drilling Company **Bransen Drilling**

Address **406 W Broadway Suite F**

City, State, Zip **Moses Lake, WA 98837**

Contractor's Registration No. **BRANSDL954N5** Date **10-19-17**

ECY 050-1-20 (Rev 02-2010) To request ADA accommodation including materials in a format for the visually impaired, call Ecology Water Resources Program at 360-407-6872. Persons with impaired hearing may call Washington Relay Service at 711. Persons with speech disability may call TTY at 877-833-6341.

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☐ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ■ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

■ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☐ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 8 inches, drilled 100 ft. Depth of completed well 100 ft.

CONSTRUCTION DETAILS

Casing ■ Welded 8 " Diam. from 0 ft. to 82 ft.

Installed: ■ Liner installed 6 " Diam. from 80 ft. to 100 ft.

☐ Threaded _____ " Diam. From _____ ft. to _____ ft.

Perforations: ■ Yes ☐ No

Type of perforator used Skill Saw

SIZE of perfs 6 in. by .25 in. and no. of perfs _____ from 80 ft. to 100 ft.

Screens: ☐ Yes ■ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ■ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ■ Yes ☐ No To what depth? 20 ft.

Material used in seal Bentonite

Did any strata contain unusable water? ☐ Yes ■ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 25 ft. below top of well Date 10-19-17

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☐ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 50 gal./min. with stem set at 80 ft. for 1 hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? ☐ Yes ■ No

CURRENT

Notice of Intent No. WE29013

Unique Ecology Well ID Tag No. BKT-480

Water Right Permit No. _____

Property Owner Name (b) (6)

Well Street Address (b) (6)

City Moses Lake County Grant

Location SW/4-1/4 NE 1/4 Sec 17 Twn 19N R 28E (s, t, r Still REQUIRED) EWM ■ Or WWM ☐

Lat/Long

Lat Deg _____ Lat Min/Sec _____

Long Deg _____ Long Min/Sec _____

Tax parcel No. (Required) 170652000

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Top Soil	0	5
Gravel	5	60
Brown Clay	60	80
Brown Basalt	80	100

RECEIVED

NOV 09 2017

Department of Ecology
Eastern Washington Office

Start Date 10-18-17 Completed Date 10-18-17

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

■ Driller ☐ Engineer ☐ Trainee Name Salvador Valenciano

Driller/Engineer/Trainee Signature

Driller or trainee License No. 2986

IF TRAINEE: Driller's License No:

Driller's Signature: Salvador V-A.

Drilling Company Bransen Drilling

Address 406 W Broadway Suite F

City, State, Zip Moses Lake, WA 98837

Contractor's Registration No. BRANSDL954N5 Date 10-19-17

ECY 050-1-20 (Rev 02-2010) To request ADA accommodation including materials in a format for the visually impaired, call Ecology Water Resources Program at 360-407-6872. Persons with impaired hearing may call Washington Relay Service at 711. Persons with speech disability may call TTY at 877-833-6341.

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 160 ft. Depth of completed well 145 ft.

CONSTRUCTION DETAILS

Casing ☒ Welded 6 " Diam. from +2 ft. to 116 ft.

Installed: ☒ Liner installed 4 " Diam. from ~~-25~~ ft. to ~~116~~ ft.

☐ Threaded _____ " Diam. From -25 ft. to 145 ft.

Perforations: ☒ Yes ☐ No

Type of perforator used SAW CUT

SIZE of perfs 1/4 in. by 7 in. and no. of perfs 90 from 105 ft. to 145 ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.

Material used in seal DRY BENTONITE

Did any strata contain unusable water? ☒ Yes ☐ No

Type of water? SURFACE Depth of strata 22'-53'

Method of sealing strata off CASED

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 20 ft. below top of well Date 3/29/17

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 28 gal./min. with stem set at 158 ft. for 2 hrs.

Artesian flow _____ g.p.m. Date 3/29/17

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CURRENT

Notice of Intent No. W356242

Unique Ecology Well ID Tag No. BKW 707

Water Right Permit No. Exempt

Property Owner Name (b) (6) [redacted]

Well Street Address _____

City Moses Lake County Grant

Location SW 1/4-1/4 SW 1/4 Sec 17 Twn 19 R 28 (s, t, r Still REQUIRED) EWM ☒ Or WWM ☐

Lat/Long Lat Deg ____ Lat Min/Sec ____ Long Deg ____ Long Min/Sec ____

Tax Parcel No. (Required) 121126446

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
TOPSOIL	0	1'
Gravel & Soil	1'	5'
Gravel	5'	22'
Gravel & H2O	22'	53'
Brown clay	53'	90'
Gray Blue clay	90'	103'
Brown clay	103'	106'
Brown Basalt & Brown Clay	106'	110'
Brown Cavey Basalt H2O	110'	160'

RECEIVED

APR 25 2017

Department of Ecology
Eastern Regional Office

Start Date 3/29/17 Completed Date 3/29/17

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) CODE

Driller/Engineer/Trainee Signature D. CODE

Driller or trainee License No. 3165

IF TRAINEE: Driller's License No:

Driller's Signature:

Drilling Company DC DRILLING INC.

Address P.O. BOX 1269

City, State, Zip ROYAL CITY • WA 99357

Contractor's Registration No. DCDRIC0875OF Date 3/29/17

ECY 050-1-20 (Rev 02/10) *If you need this document in an alternate format, please call the Water Resources Program at 360-407-6872. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.*

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 140 ft. Depth of completed well 136 ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 6 " Diam. from +2 ft. to 116 ft.

☐ Liner installed _____ " Diam. from _____ ft. to _____ ft.

☐ Threaded _____ " Diam. From _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No

Type of perforator used _____

SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.

Material used in seal Bentonite

Did any strata contain unusable water? ☒ Yes ☐ No

Type of water? Surface Depth of strata 40'-80'

Method of sealing strata off Cased

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 35 ft. below top of well Date 5/3/17

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 50+ gal./min. with stem set at 138 ft. for 2 hrs.

Artesian flow _____ g.p.m. Date 5/3/17

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CURRENT

Notice of Intent No. W356220

Unique Ecology Well ID Tag No. BKW 721

Water Right Permit No. Exempt

Property Owner Name (b) (6)

Well Street Address _____

City Moses Lake County Grant

Location NE 1/4-1/4 NW 1/4 Sec 36 Twn 20 R 27 (s, t, r Still REQUIRED) EWM ☒ Or WWM ☐

Lat/Long Lat Deg ____ Lat Min/Sec ____ Long Deg ____ Long Min/Sec ____

Tax Parcel No. (Required) 120724409

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Top Soil	0'	1'
Gravel & Cobbles	1'	15'
Gravel	15'	78'
Brown Clay	78'	91'
Gray Clay	91'	117'
Brown clay & Brown Basalt	117'	124'
Brown Basalt & H2O	124'	140'

RECEIVED

AUG 07 2017

Department of Ecology
Eastern Washington Office

Start Date 5/3/17 Completed Date 5/3/17

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Cole

Driller/Engineer/Trainee Signature D. Cole

Driller or trainee License No. 3165

IF TRAINEE: Driller's License No:

Driller's Signature:

DC DRILLING INC.

Drilling Company P.O. BOX 1269

Address ROYAL CITY • WA 99357

City, State, Zip

Contractor's Registration No. DCDRIC0875OF Date 5/3/17

ECY 050-1-20 (Rev 02/10) *If you need this document in an alternate format, please call the Water Resources Program at 360-407-6872. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.*

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 160 ft. Depth of completed well 160 ft.

CONSTRUCTION DETAILS

Casing ☒ Welded 6 " Diam. from +2 ft. to 116 ft.

Installed: ☒ Liner installed 4 " Diam. from -30 ft. to 160 ft.

☐ Threaded _____ " Diam. From _____ ft. to _____ ft.

Perforations: ☒ Yes ☐ No

Type of perforator used Saw Cut

SIZE of perfs 1/4 in. by 7 in. and no. of perfs 90 from 140 ft. to 160 ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.

Material used in seal Dry Bentonite

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 43 ft. below top of well Date 5/10/17

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 501 gal./min. with stem set at 158 ft. for 2 hrs.

Artesian flow _____ g.p.m. Date 5/10/17

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☐ No

CURRENT

Notice of Intent No. IW310203

Unique Ecology Well ID Tag No. BKW 724

Water Right Permit No. Exempt

Property Owner Name (b) (6) [redacted]

Well Street Address _____

City Moses Lake County Grant

Location SW 1/4-1/4 SW 1/4 Sec 8 Twn 19 R 28 EWM ☒ Or WWM ☐

(s, t, r Still REQUIRED)

Lat/Long Lat Deg ____ Lat Min/Sec ____ Long Deg ____ Long Min/Sec ____

Tax Parcel No. (Required) 120942000

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Topsoil	0'	1'
Cobbles & Gravel	1'	7'
Gravel	7'	41'
Brown Clay	41'	85'
Gray Clay	85'	108'
Brown Clay	108'	114'
Brown Basalt & Brown Clay	114'	149'
Brown Basalt & H_2O	149'	160'

RECEIVED

AUG 07 2017

Department of Ecology
Eastern Washington Office

Start Date 5/10/17 Completed Date 5/10/17

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) D. Cole

Driller/Engineer/Trainee Signature D. Cole

Driller or trainee License No. 3165

IF TRAINEE: Driller's License No:

Driller's Signature:

DC DRILLING INC.

Drilling Company

P.O. BOX 1269

Address

ROYAL CITY • WA 99357

City, State, Zip

Contractor's Registration No. DCDRIC087549F Date 5/10/17

ECY 050-1-20 (Rev 02/10) *If you need this document in an alternate format, please call the Water Resources Program at 360-407-6872. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.*

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 140 ft. Depth of completed well 140 ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 6" Diam. from +2 ft. to 116 ft.

☐ Liner installed _____" Diam. from _____ ft. to _____ ft.

☐ Threaded _____" Diam. From _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No

Type of perforator used _____

SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.

Material used in seal Dry Bentonite

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 35 ft. below top of well Date 5/11/17

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 100+ gal./min. with stem set at 138 ft. for 2 hrs.

Artesian flow _____ g.p.m. Date 5/11/17

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CURRENT

Notice of Intent No. W310205

Unique Ecology Well ID Tag No. BKW725

Water Right Permit No. Exempt

Property Owner Name (b) (6) [redacted]

Well Street Address [redacted]

City Moses Lake County Grant

Location NW 1/4-1/4 NE 1/4 Sec 36 Twn 20 R 27 (s, t, r Still REQUIRED) EWM ☒ Or WWM ☐

Lat/Long Lat Deg ____ Lat Min/Sec ____ Long Deg ____ Long Min/Sec ____

Tax Parcel No. (Required) 120724115

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Topsoil	0'	1'
Cobbles & Gravel	1'	7'
Gravel	7'	37'
Brown Clay	37'	62'
Brown Clay & Gravel	62'	66'
Brown Clay	66'	86'
Gray Clay	86'	113'
Brown Clay & Basalt	113'	125'
Brown Basalt & H_2O	125'	140'

RECEIVED

AUG 07 2017

Department of Ecology
Eastern Washington Office

Start Date 5/11/17 Completed Date 5/11/17

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Cole

Driller/Engineer/Trainee Signature [signature]

Driller or trainee License No. 3165

IF TRAINEE: Driller's License No:

Driller's Signature:

DG DRILLING INC.

Drilling Company

P.O. BOX 1269

Address

ROYAL CITY • WA 99357

City, State, Zip

Contractor's Registration No. DGDRIC087SOF Date 5/11/17

ECY 050-1-20 (Rev 02/10) *If you need this document in an alternate format, please call the Water Resources Program at 360-407-6872. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.*

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 160 ft. Depth of completed well 160 ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 6 " Diam. from +2 ft. to 136 ft.

☐ Liner installed _____ " Diam. from _____ ft. to _____ ft.

☐ Threaded _____ " Diam. From _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No

Type of perforator used _____

SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.

Material used in seal Dry Bentonite

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 46 ft. below top of well Date 6/29/17

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 50+ gal./min. with stem set at 158 ft. for 2 hrs.

Artesian flow _____ g.p.m. Date 6/29/17

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CURRENT

Notice of Intent No. W310213

Unique Ecology Well ID Tag No. BKW736

Water Right Permit No. Exempt

Property Owner Name (b) (6)

Well Street Address _____

City Moses Lake County Grant

Location SE 1/4-1/4 SE 1/4 Sec 36 Twn 20 R 27 (s, t, r Still REQUIRED) EWM ☒ Or WWM ☐

Lat/Long Lat Deg ____ Lat Min/Sec ____ Long Deg ____ Long Min/Sec ____

Tax Parcel No. (Required) 3115 2000

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Topsoil	0	1'
Gravel & Cobbles	1'	9'
Gravel	9'	33'
Brown Clay	33'	71'
~~[illegible]~~	~~71'~~	~~[illegible]~~
~~[illegible]~~	~~[illegible]~~	
Gray Clay	71'	125'
Brown Clay	125'	130'
Brown Clay & Brown Basalt	130'	137'
Brown Basalt & H2O	137'	160'

RECEIVED

AUG 04 2017

Department of Ecology
Eastern Washington Office

Start Date 6/29/17 Completed Date 6/29/17

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) D. Cole

Driller/Engineer/Trainee Signature D. Cole

Driller or trainee License No. 3165

IF TRAINEE: Driller's License No:

Driller's Signature:

Drilling Company

Address

City, State, Zip

Contractor's Registration No. DCDRICD875OF Date 6/29/17

ECY 050-1-20 (Rev 02/10) *If you need this document in an alternate format, please call the Water Resources Program at 360-407-6872. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.*

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 126 ft. Depth of completed well 103 ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 6 " Diam. from +2 ft. to 18 ft. ☐ Liner installed _____ " Diam. from _____ ft. to _____ ft. ☐ Threaded _____ " Diam. From _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No

Type of perforator used _____

SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.

Material used in seal Dry Bentonite

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 21 ft. below top of well Date 9/7/17

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 37 gal./min. with stem set at 123 ft. for 2 hrs.

Artesian flow _____ g.p.m. Date 9/7/13

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CURRENT

Notice of Intent No. W310236

Unique Ecology Well ID Tag No. BKW751

Water Right Permit No. Exempt

Property Owner Name (b) (6) [redacted]

Well Street Address _____

City Moses Lake County Grant

Location NE 1/4-1/4 SW 1/4 Sec 35 Twn 20 R 28 (s, t, r Still REQUIRED) EWM ☒ Or WWM ☐

Lat/Long Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

Tax Parcel No. (Required) 121642153

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Top Soil	0	1'
Gravel & Cobbles	1'	5'
Brown Basalt & Clay	5'	16'
Brown Basalt	16'	37'
Hard Gray Basalt	37'	71'
Black Basalt Hard	71'	83'
Brown Basalt & Clay soft	83'	88'
Black Basalt medium	88'	96'
Brown Basalt H_2O Cavey	96'	108'
Black Basalt Hard	108'	123'
Brown Basalt H_2O	123'	126'
Caved in at 103'		
Still Have 37 gpm at BW 103'		
RECEIVED NOV 09 Department of Ecology Eastern Washington		

Start Date 9/7/17 Completed Date 9/7/17

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Cole

Driller/Engineer/Trainee Signature _____

Driller or trainee License No. 3165

IF TRAINEE: Driller's License No: _____

Driller's Signature: _____

Drilling Company DC DRILLING INC.

Address P.O. BOX 1269

City, State, Zip ROYAL CITY • WA 99357

Contractor's Registration No. DCDRIC887501 Date 9/7/17

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

CURRENT

Notice of Intent No. W310233

Unique Ecology Well ID Tag No. BKW753

Water Right Permit No. Exempt

Property Owner Name (b) (6)

Well Street Address _____

City Quincy County Grant

Location _1/4-1/4 _1/4 Sec 11 Twn 20 R 24 EWM ☒ Or WWM ☐

(s, t, r Still REQUIRED)

Lat/Long Lat Deg ____ Lat Min/Sec ____

Long Deg ____ Long Min/Sec ____

Tax Parcel No. (Required) 200342000

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 120 ft. Depth of completed well 120 ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 6 " Diam. from +2 ft. to 96 ft.

☐ Liner installed _____ " Diam. from _____ ft. to _____ ft.

☐ Threaded _____ " Diam. From _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No

Type of perforator used _____

SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.

Material used in seal Dry Bentonite

Did any strata contain unusable water? ☒ Yes ☐ No

Type of water? Surface Depth of strata 19-85

Method of sealing strata off Cased

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 7 ft. below top of well Date 9/9/17

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 50+ gal./min. with stem set at 118 ft. for 2 hrs.

Artesian flow _____ g.p.m. Date 9/9/17

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Top Soil	0'	5'
Clay & Soil	5'	15'
Cledcay Rock	15'	20'
Clay Brown & Silt H2O	20'	65'
Tan Clay & Basalt Brown	65'	72'
Brown Basalt & Brown Clay	72'	96'
Brown Basalt	96'	103'
Gray Hard Basalt	103'	105'
Brown Basalt H2O	105'	117'
Hard Gray Basalt	117'	120'

RECEIVED

NOV 09 2017

Department of Ecology
Eastern Washington Office

Start Date 9/9/17 Completed Date 9/9/17

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Cole

Driller/Engineer/Trainee Signature D. Cole

Driller or trainee License No. 3165

IF TRAINEE: Driller's License No:

Driller's Signature:

Drilling Company

Address

City, State, Zip

Contractor's Registration No. DCARTC087SOF Date 9/9/17

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WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 80 ft. Depth of completed well 80 ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 6 " Diam. from +2 ft. to 78 ft.

☐ Liner installed _____ " Diam. from _____ ft. to _____ ft.

☐ Threaded _____ " Diam. From _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No

Type of perforator used _____

SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.

Material used in seal Dry Bentonite

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 40 ft. below top of well Date 9/28/17

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 35 gal./min. with stem set at 78 ft. for 2 hrs.

Artesian flow _____ g.p.m. Date 9/28/17

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CURRENT

Notice of Intent No. W310242

Unique Ecology Well ID Tag No. BKW 763

Water Right Permit No. Exempt

Property Owner Name (b) (6) [redacted]

Well Street Address _____

City Moses Lake County Grant

Location SE ¼-1/4 NW ¼ Sec 35 Twn 20 R 27 EWM ☒ Or WWM ☐

(s, t, r Still REQUIRED)

Lat/Long Lat Deg ____ Lat Min/Sec ____

Long Deg ____ Long Min/Sec ____

Tax Parcel No. (Required) 121255007

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Top Soil	0	1'
Cobbles & Gravel	1'	17'
Gravel	17'	42'
Gravel & H2O	42'	79'
Gravel & Clay Tan	79'	80'

RECEIVED

NOV 09 2017

Department of Ecology

Eastern Washington Office

Start Date 9/28/17 Completed Date 9/28/17

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☐ Driller ☐ Engineer ☐ Trainee Name (Print) Cole

Driller/Engineer/Trainee Signature Drw

Driller or trainee License No. 3165

IF TRAINEE: Driller's License No:

Driller's Signature:

Drilling Company DC DRILLING INC.

Address P.O. BOX 1269

City, State, Zip ROYAL CITY • WA 99357

Contractor's Registration No. DCDRIC087CO Date 9/28/17

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